Oracle Platinum Partner

gDBClone With Oracle Database Appliances

Rapid Provisioning

November 2020

Charles Kim, Oracle ACE Director
Imran Mohammed, Database Consultant

@racdba

ORACLE Platinum Partner

Charles Kim

VISCOSITY NORTH AMERICA

- Oracle ACE Director, VMware vExpert
- Author of 10 books on Oracle
- Founder and CEO of Viscosity
- Over 28 years of Oracle Expertise: Mission Critical Databases, RAC, Data Guard, ASM, RMAN, Shareplex/GoldenGate
- Specialize in "**Complex Data Replication** & **Integration**" with **Shareplex** & **GG**
- Oracle Management Cloud Certified
- Oracle Exadata Certified Implementation Specialist, (2014, 2016)
- Oracle Certified RAC Expert
- Oracle Linux Certified Expert

vmware vEXPERT

CERTIFIED vmware PROFESSIONAL

redhat. CERTIFIED

@ViscosityNA

ORACLE Certified Professional

ORACLE ACE Director

Industry Experts

VISCOSITY NORTH AMERICA

ORACLE Platinum Partner

- Oracle ODA Partner Of The Year 2019
- 38 Zero Downtime Migrations and Upgrades in a single year
- Recent 18c/19c Accomplishments
  - ★ 5 Node RAC upgrade from 11.2 to 18c with zero downtime
  - ★ 20 TB database migration from AIX to Linux and upgrade to 19c with zero downtime
  - ★ Migrate to Engineered Systems and upgrade to Oracle 19c with zero downtime

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Oracle License Management
Get the most out of your Oracle investment

ZERO DOWNTIME Migrations

Apps
SaaS/PaaS, Mobility, Application Development

Professional Services
Where you need it most

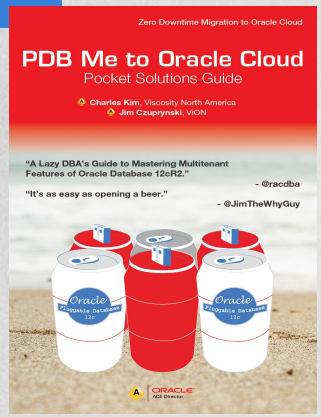
Performance Health Checks
How's it running?

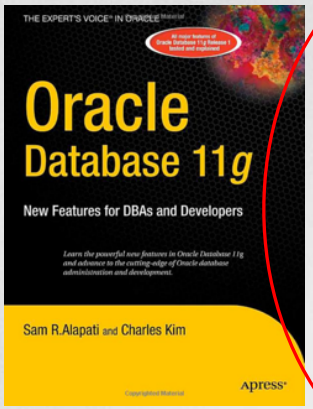
Staff Aug
Workforce Capacity on Demand

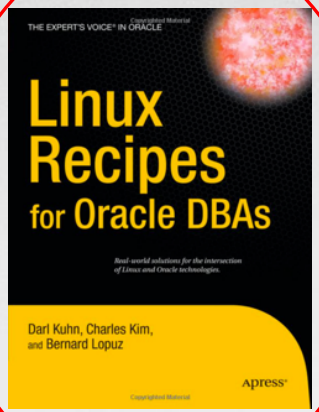
DBA Services
Remote and On-site

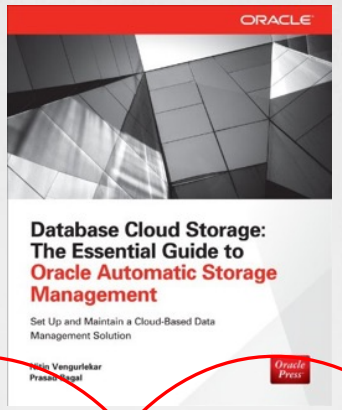
On-Call Support Managed Services

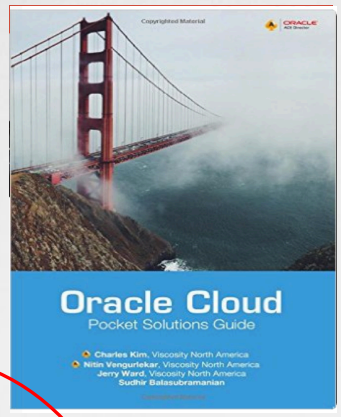
We wrote the books

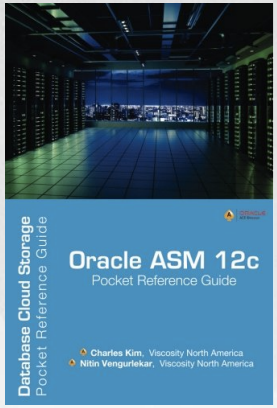


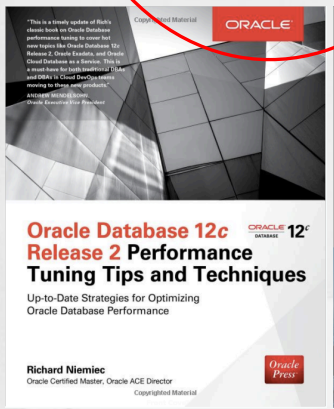


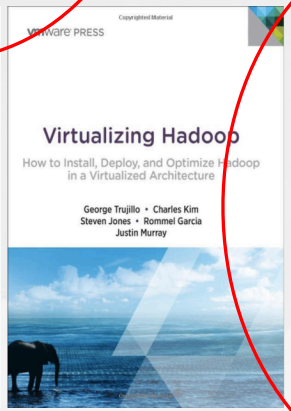


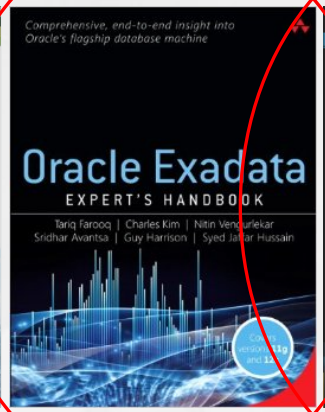


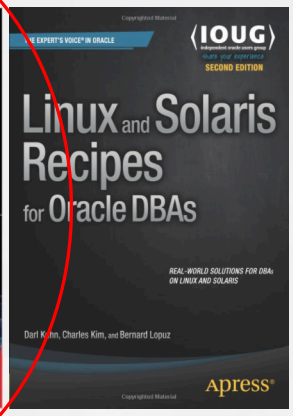


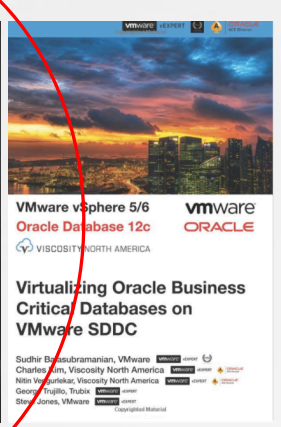












ODA Command Line Interface (odacli) Reference Sheet

Viscosity North America

Oracle Certified DBAs
Oracle Certified RAC Experts
Oracle Certified Cloud Experts

Performance Tuning Experts
Engineered Systems Experts

Oracle ACE
Oracle ACE Director

VISCOSITY
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Data & Cloud Architects. Genuine Experts.
www.viscosityna.com

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ODA Command Sets

The following are daily system and database management. All commands reference a ODA X8-2 & X7-2-HAs.

Database

```
odacli list-dbhomes

odacli create-dbhome

odacli list-databases

odacli create-database -m -n vnadb -v
11.2.0.4 -r ASM -y SI -s odb1 -cl OLTP

odacli describe-database --dbid 56a971f1-
f115-443c-852d-4f51662adacd

odacli register-database --dbclass OLTP
--dbshape od2 --servicename vna -p

odacli create-prepatchreport –dbhomeid
56a971f1-f115-443c-852d-4f51662adacd

odacli create-prepatchreport -v

odacli delete-database --dbid 56a971f1-
f115-443c-852d-4f51662adacd -fd

odacli delete-dbhome –dbhomeid 56a971f1-
f115-443c-852d-4f51662adacd
```

Database Migration and Standby

```
odacli register-database

odacli create-database -n vnadb -dh
4f5941d1-0f01-40d5-b5fe-502ab4f61382 -r
ACFS -io -m
```

Database Storage

```
odaadmcli show diskgroup

odacli list-dbstorages

odacli describe-dbstorage -i
```

WebConsole Access

```
https://host name or ip-address:7093/mgmt/
index.html
```

ODA DCS Log Files

The ODA log files are located across numerous directories, and generated when command-line or Web Console actions are executed or an event occurs. These logs are useful when you need to track and debug jobs.

The /opt/oracle/dcs/log directory is the central location for most ODA related events, including:
Agent-specific activities
The DCS Agent, controller, patching-related information and command-line interface output appears in the /opt/oracle/dcs/log/dcs-agent.log file.

If an error occurs in the command-line interface layer, then the output will show in the /opt/oracle/dcs/log/dcscli.log file first.

When creating an SR, upload all of the logs in the /opt/oracle/dcs/log directory.

Storage Logs

Storage-related activity is logged in the oakd log file, /opt/oracle/oak/log/hostname/oak/oakd.log
For example, /opt/oracle/oak/log/myhost/oak/oakd.log

Use the odaadmcli manage diagcollect command to collect diagnostic logs for storage components. The files are saved in the oakdiag log file, /opt/oracle/oak/log/hostname/oakdiag/file name.tar.gz

Oracle Auto Service Request (Oracle ASR) Log Files

All log files for Oracle ASR are located in the /var/opt/asrmanager/log/ directory.

Viscosity's ODA Cheat Sheet

odacli Pocket Reference Sheet

Send us an email for a copy

Patching

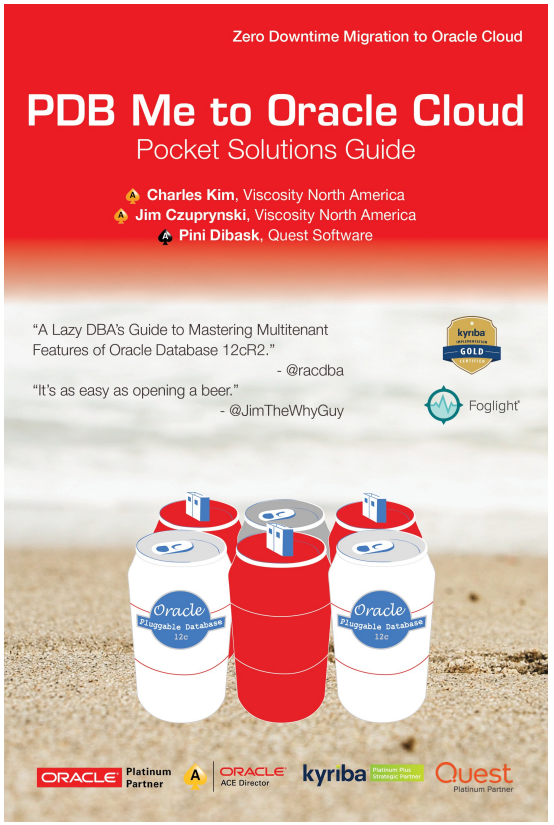
```
odacli update-repository -f /home/user11/
p23494985_121280_Linux-x86-64.zip

odacli describe-latestpatch

odacli update-server

odacli update-dcsagent -v 12.2.1.4.0

odacli update-dbhome -i 56a971f1-f115-
443c-852d-4f51662adacd

odacli update-asr

odacli update-storage -v 12.2.1.4.0
```

5 winners will receive a Pluggable Database book

Enter our raffle by being added to our monthly events mailing list (If you're already registered, you can still enter to win!)

To enter, email hello@viscosityna.com

- Required info to be entered into Raffle:
  - First and Last Name
  - Job Title
  - Zip code
  - Event you attended for raffle



6 Part Series (Hands on Lab Workshop):

- **Oracle Database 12.2/18c/19c New Features Workshop**
  - New Features Pocket Handbook Coming Soon
  - Will cover Oracle Database 12.2, 18c and 19c
- **Data Guard 19c Workshop**
- **Oracle Database 19c Performance Tuning Workshop**
  - **Pocket Handbook Coming Soon**
- **Oracle Database 19c Upgrade Workshop**
  - **Upgrade Pocket Handbook Coming Soon**
- **Oracle Database 19c Pluggable Databases Workshop**
  - **PDB Pocket Handbook**
- **Oracle Database 19c Security Workshop Coming in January**
- **Oracle Database Appliance (ODA) 19c Workshops**

Oracle Database 19c Workshop

https://viscosityna.com/oracle-19c-experience/

Viscosity Master Class

Up Next: Tuesday, November 17, 2020 | 11:00 AM - 12:00 PM Central

REGISTER NOW

viscosityna.com/viscosity-master-class/
viscosityna.com/event

Oracle Database Expert Panel

Tuesday November 17, 2020 | 11:00 AM CT – 12:00 PM CT

Charles Kim

Founder and CEO, Viscosity North America

Oracle ACE Director

Rich Niemiec

Chief Innovation Officer, Viscosity North America

Oracle ACE Director

Maria Colgan

Distinguished Product Manager, Oracle Corporation

Andy Rivenes

Product Manager Database In-Memory, Oracle Corporation

Troy Ligon

Oracle ACE & Enterprise Architect, President of SOUG

Qualified POCs

- Viscosity has our own ODA X8-2 HA

- Look for our upcoming book on ODAs
  - ODA Architecture
  - Migrating Databases to ODA
  - ODA Performance Tuning
  - ODA Use Cases
  - ODA Imaging
  - ODA Patching

ODA Partner of the Year

- http://oracleoda.com
- http://www.oracleoda.com/category/gdbclone/
- http://www.oracleoda.com/oda-workshop-part-2-gdbclone/

Agenda

- Upgrade to Oracle Database 19c
- Customer Use Cases

- Why ODAs?

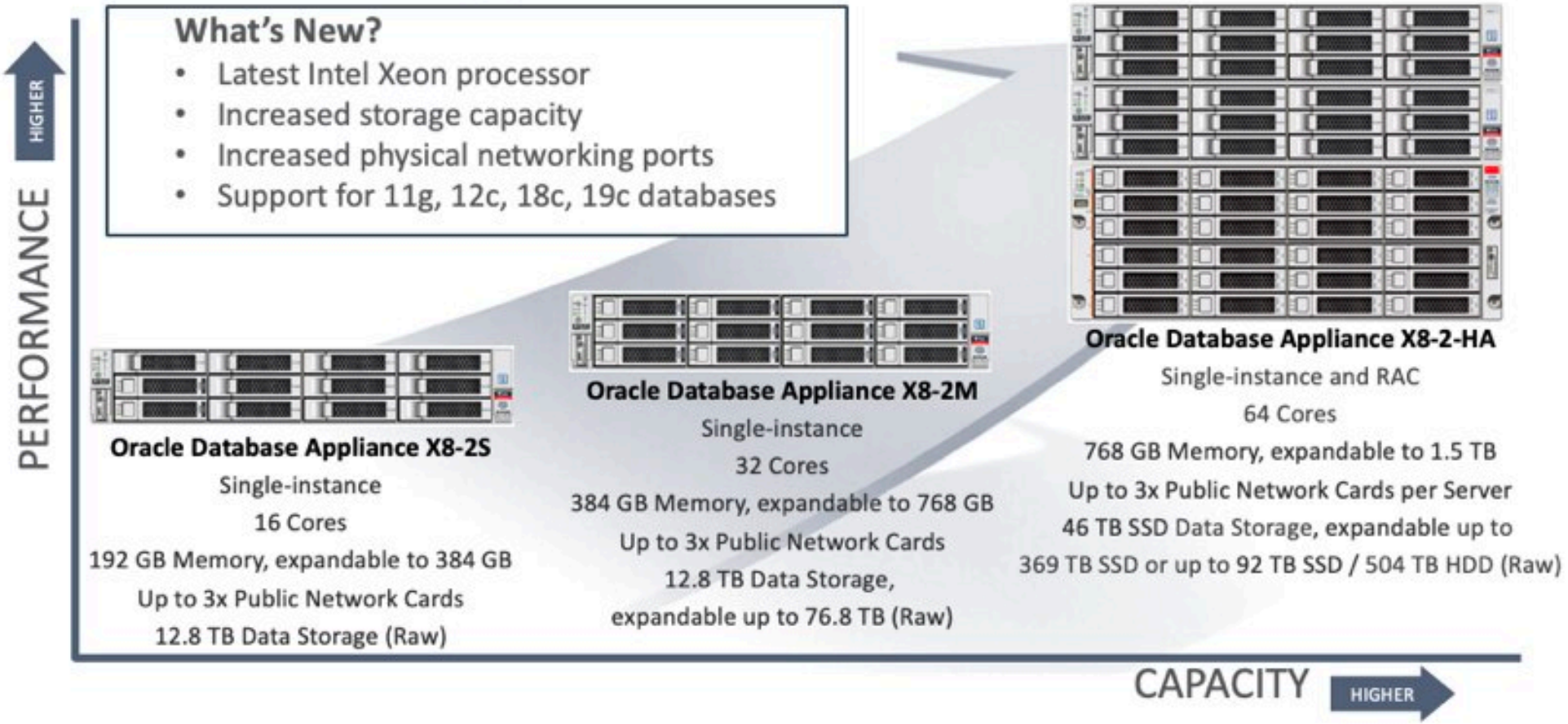
- New Features in ODA 19.8 and 19.9

- gDBClone Deep Dive Lecture

- LAB
  - gDBClone Straight Clone of a Master
  - gDBClone Snap of a Clone
  - gDBClone Create a DG Physical Standby (Not Active DG)
  - gDBClone Snap of a Standby

Latest X8 ODA Product Line

Oracle Database Appliance X8 Model Family



Need to Upgrade to Oracle Database19c

AMERICA

Upgrade Plans

Upgrade On-Premise? Upgrade to Engineered Systems?

- How many are Terminal Release to Terminal Release customers?

- How many are planning to upgrade in
  - 6 months
  - 12 months
  - 24 months
  - Already There?

- Interesting in doing Zero Downtime and Zero Risk Upgrades?
- Still running legacy versions?

Oracle 19c - Oracle's Recommended Roadmap

- **Oracle strongly recommends that customers upgrade their databases to Oracle Database 19c**
  - **19c is the terminal release of Oracle Database 12c Release 2**
  - **19c is the long-term support or extended support will only be offered on this version**

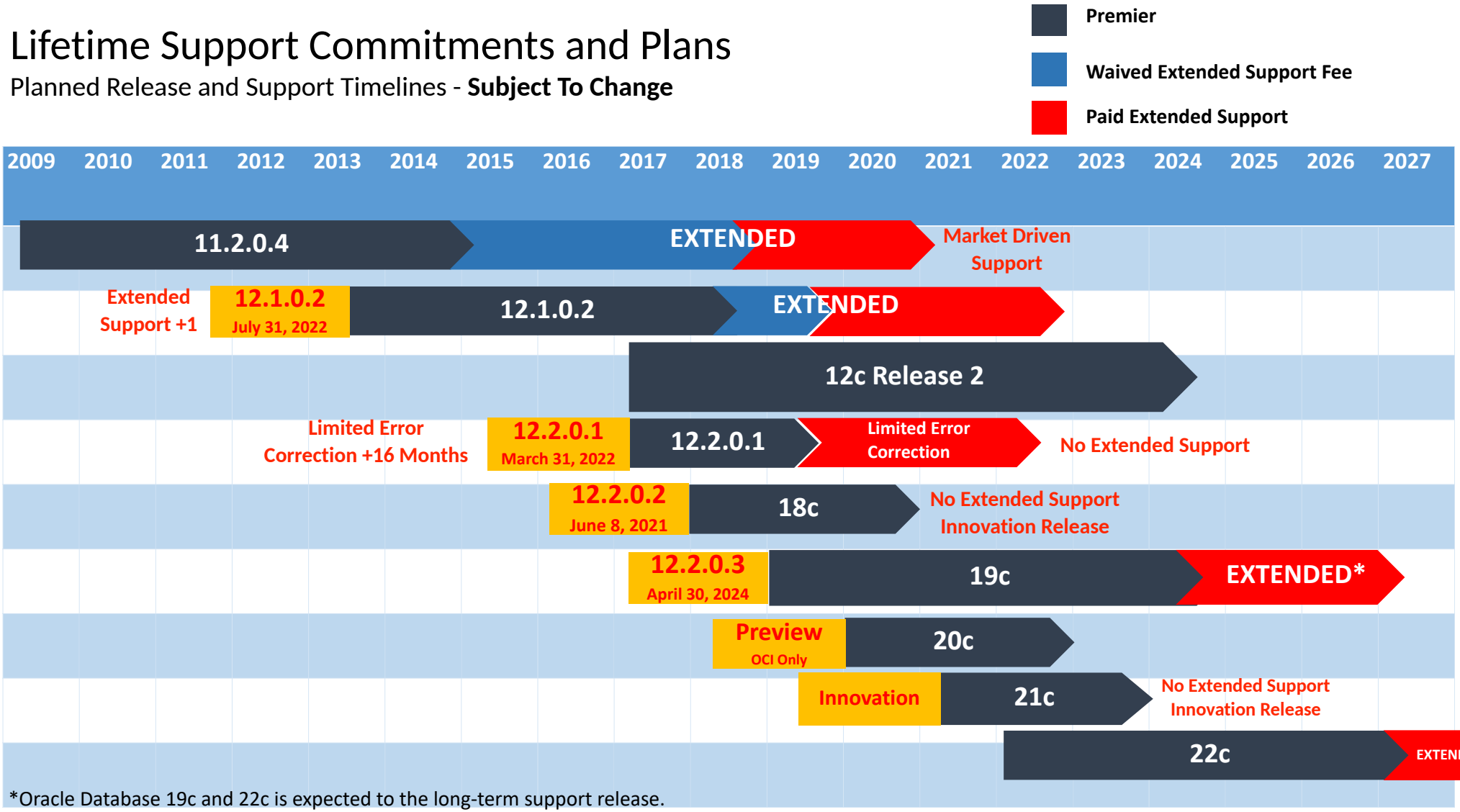
- **Extended** support will not be available for 12.2.0.1or 18c releases.

Oracle Release Dates - Upgrade & Modernize to 19c

Oracle Database 11g Release 1	Aug 2007
Oracle Database 11g Release 2 - Potentially sitting on 11 year old hardware infrastructure	Sept 2009
Oracle Database 12c Release 1	June 2013
Oracle Database 12c Release 1 (Patchset) - 12.1.0.2 - Potentially sitting on 6 year old hardware infrastructure	June 2014
Oracle Database 12c Release 2 (Cloud)	September 2016
Oracle Database 12c Release 2 (On-premise)	March 2017
Oracle 18c - "Cloud First"	February 2018
Oracle 18c – Available on Exadata	February 2018
Oracle 18c – Available on ODA	March 2018
Oracle 18c – On-Premise	July 2018
Oracle 19c - Exadata On-Premise Oracle 19c - General Availability - Terminal Release	Feb 13, 2019 April 2019
Oracle Database 20c Preview Release on OCI	Feb 14, 2020

Lifetime Support Commitments and Plans

Planned Release and Support Timelines - **Subject To Change**



*Oracle Database 19c and 22c is expected to the long-term support release.

Always check MOS Note **742060.1** for the latest schedule

Customer Use Cases

Simplified Maintenance and Upgrade Viscosity ODA Success Stories

- Large Dialysis Management Company
- United Physician - ODA in a Box
- 1.5B Health Care Insurance Processing Company
- Leading Clinical Trial Company - 2 X ODA
- One of the largest colleges in Texas

Viscosity ODA Customer Sample

Vertical	Customer Description	State	Cost	EBS	License Containment	No ODA Admin	No Dedicated DBA	Virtual	ODA for Disaster Recovery	HCC	Snapshot/ Clone	Managed Services	Engagement Summary	ODA Specs
Healthcare	Dialysis provider available for people living with chronic and acute renal disease	Texas											Roadmap and implementation of ODAs	Multiple HAs, M and S
Healthcare	Comprehensive business resource to physicians	Michigan											ODA implementation on a virtualized infrastructure	Multiple HAs
Healthcare	1.5B Health Care Medicaid Insurance Processing Company	Michigan											Healthcheck and assessment of legacy ODAs and migration to new	Multiple HAs
Healthcare	Leading Clinical Trial Company	Texas											ODA refresh migration and managed services	M and S
Higher Ed	One of the largest colleges in Texas	Texas											ODA implementation for off shore research	Multiple Ms
Healthcare	The world's leading organization of board-certified pathologists.	Illinois											100+ databases on ODA, ACFS	Multiple HAs, Ms
Vendor Management	Contingent workforce solutions that meet your procurement and statement of work needs.	Colorado											DR for Exadata, Virtualized ODA for license containment	Multiple HAs
Supply chain	Global provider of supply chain management solutions for the food and beverage industry	California											Solaris to ODA, ACFS, Snapshot/Clone	Multiple Ms
Manufacturing	Builds high-performance polymers for demanding applications across various industries	South Carolina											EBS on ODA	Multiple HAs and S
Transportation	An express commuter rail, bus routes and paratransit services moves more than 220,000 passengers per day across our 700-square-mile service area	Texas											ODA Training	Multiple HAs
Healthcare	Health insurance provider	Minnesota											ODA and Database Healthcheck	Multiple Ss
Federal	Provides strategic back office services & FedRAMP Ready hosting solutions in a variety of industries	Virginia											Configured and built the Oracle Database	Multiple HAs
Healthcare	Health insurnace provider	Alabama											Third Party Medical Application on Oracle	Multiple Ss
Oil and Gas	Designs, builds, maintains and operates the Pipeline System	Alaska											EBS in a Box on ODA, Virtualized ODA	Multiple HAs
Retail	Reseller of brand-name shoes, boots, sandals, and sneakers for the whole family	Indiana											Replatform of Exadata to ODA	Multiple HAs
Food	Fast food, chain burger company	California											ODA with snapshot and GDBclone	Multiple Ms
Banking / Financial	Offers savings & checking accounts, mortgages, auto loans, online banking	Utah											ODA implementaiton for OLTP workload	Multiple Ms

Why ODA?

SIMPLIFIED, OPTIMIZED, and AFFORDABLE

Single support site

Single pane of glass for management
* With the ODA Plug-in for OEM

VISCOSITY

Hard Partitioning
Limit the licenses of your Applications

With OVM

- Applicable for ODA X8-2 HA

- Run Windows on ODAs on OVM

- Run Middleware on ODAs on OVM or KVM
- Run OBIEE on ODAs for license containment
- Run ODI on ODAs for license containment

With KVM

- Hard Partitioning on KVM to come in the near future!

Bare Metal License Options for ODA X8-2 HA

Licensed Cores for Each Node (X7-2-HA Only)	Active Cores for Oracle RAC and Oracle Enterprise Edition (X7-2-HA Only)	Active Cores for Oracle RAC One Node (X7-2-HA Only)
2	4	2
4	8	4
6	12	6
8	16	8
10	20	10
12	24	12
14	28	14
16	32	16
18	36	18
20	40	20

ODA In-A-Box Solution
Great Virtualization Platform - Why? **KVM in the future**

- **EBS in a Box**
- **JDE in a Box**
- **Banner in a Box**

- **Have a customer with 5VMs on ODAs X8-2 HA**

- **Have another customer running mission critical EBS on ODAs**

- **Have another customer running 2 VMs on the ODA**
  - **It is getting more popular**

- **KVM and OVM Virtualization**
    - **ODA S and M only support KVM**

- **Middleware License Containment**
- **Database Options Containment**

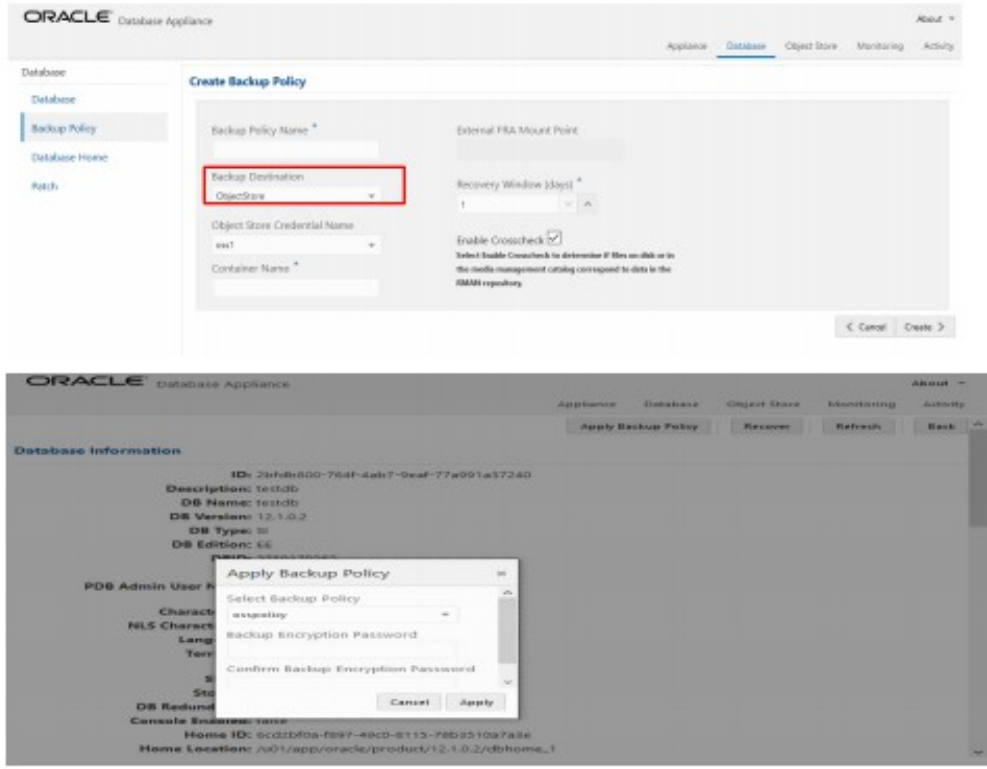
ODA Automated Database Backup

Complete Backup/Restore Life-Cycle Management using ODA's Browser User Interface

- Create backup policy with backup destination set:
  - Internal FRA (+RECO Disk Group)
  - External FRA (NFS Filesystem)
  - Object Store in Oracle Cloud

- Apply a backup policy to an existing database to trigger automatic backup

- A backup report is created for every backup that is taken:
  - Backup Levels
  - Level 0 - Full backup
  - Level 1- Daily Incremental
  - Long-Term - long-term archival backup
  - Archivelog backup



ODA Automated Database Restore

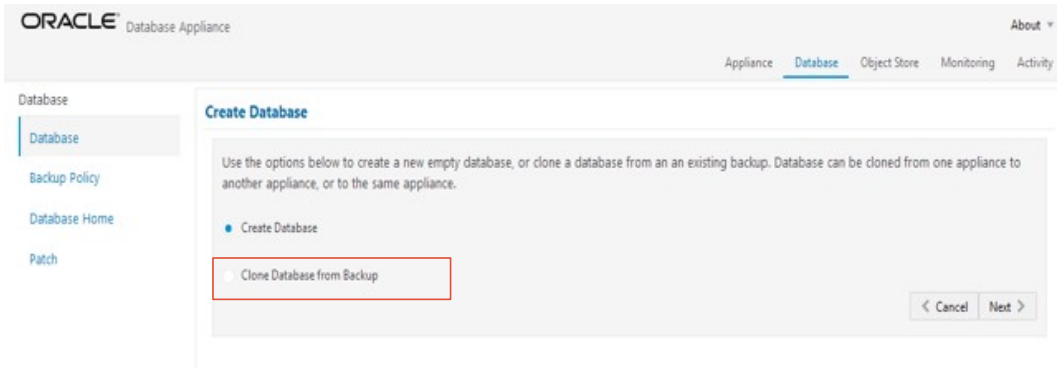
Complete Backup/Restore Life-Cycle Management using ODA's Browser User Interface

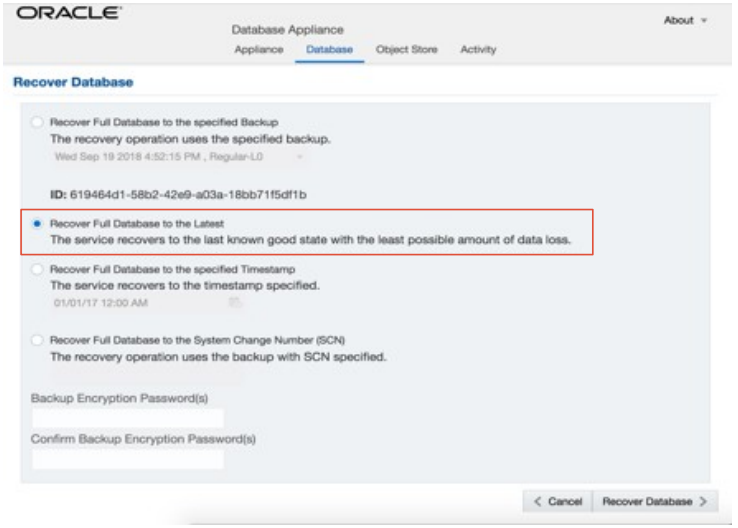
Use Restore to

- Recover database from backup
- Clone database from backup

Recovery options

- Recover to the Latest
- Point in Time Recovery (PITR)
- System Change Number (SCN)
- Specified Backup Report





Hybrid Columnar Compression

Now available on ODA

Starting in 18c

Ways to Load HCC

Insert statements with the APPEND hint

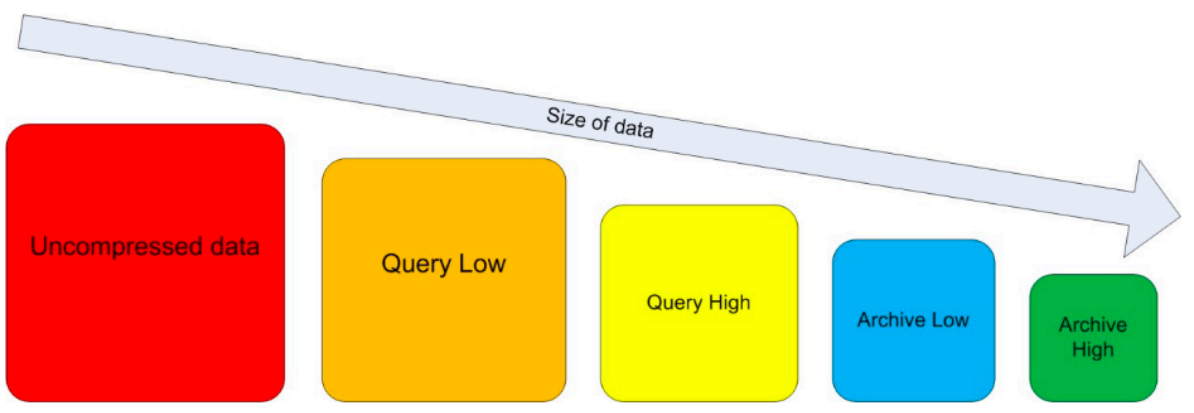
Parallel DML (parallel INSERT, UPDATE, MERGE, and DELETE)

Direct Path SQL*LDR (SQL Loader)

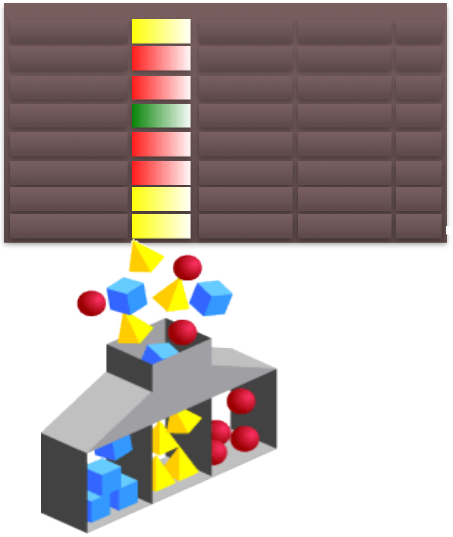
Create Table as Select (CTAS) : CREATE TABLE OI_HIGH TABLESPACE COMP COMPRESS FOR QUERY HIGH AS SELECT * FROM OE.OI;

ALTER TABLE OI_TABLE MOVE COMPRESS FOR ARCHIVE LOW;

Segments are not compressed
Indexes and LOB (Large OBject)



HCC - Hybrid Columnar Compression
Highest Capacity, Lowest Cost



- Data is organized and compressed by column
  - Dramatically better compression
- Speed Optimized **Query Mode** for Data Warehousing
  - **10X compression typical**
- Space Optimized **Archival Mode** for infrequently accessed data
  - **15X to over 50X compression typical**

Faster and Simpler
Backup, DR, Caching, Reorg, Clone

Benefits with the Multiplier effect

Table Compression Syntax

Warehouse Compression Syntax:

```
CREATE TABLE emp (…)
  COMPRESS FOR QUERY [LOW | HIGH];
```

Online Archival Compression Syntax:

```
CREATE TABLE emp (…)
  COMPRESS FOR ARCHIVE [LOW | HIGH];
```

They are not allowed to do: ALTER TABLE ... COMPRESS FOR OLTP

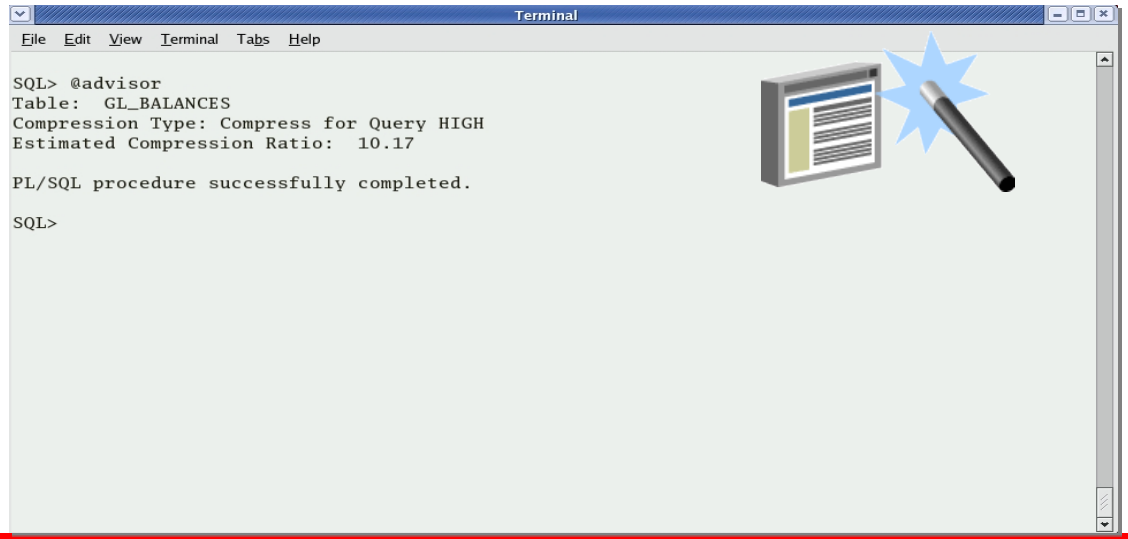
HCC Examples

```
SQL> select owner, table_name, compress_for
from dba_tables
where compression = 'ENABLED'
order by 1,2;

OWNER                          TABLE_NAME                     COMPRESS_FOR
------------------------------ ------------------------------ ------------
JWARD                          INVENTORY                      BASIC
JWARD                          AGILE_STATUS                   BASIC
SCOTT                          AK                             QUERY HIGH
SCOTT                          EHCC                           QUERY HIGH
SCOTT                          EHCC_W                         QUERY LOW
SCOTT                          EXAMPLE                        ARCHIVE LOW
SCOTT                          HCCTEST                        QUERY LOW
SCOTT                          OAVAL                          QUERY HIGH
SCOTT                          TAB1                           QUERY LOW
VIJAY                          QUALTEST                       ARCHIVE HIGH
VIJAY                          EHCC1                          QUERY HIGH
```

```
SQL> create table new_orders (myid, pid, sid, price, discount, odate)
partition by range (myid)
partition p1 values less than (1000000) nocompress,
partition p2 values less than (2000000) compress for archive low,
partition p3 values less than (3000000) compress for query high,
partition p4 values less than (maxvalue) compress for query low)
as select * from orders;
```

Compression Advisor

- New Advisor Which Started From Oracle Database 11g Release 2
  - `DBMS_COMPRESSION` PL/SQL Package
  - Estimates Hybrid Columnar Compress storage savings on non-Exadata hardware



New Features On the ODA

That You May Not Be Aware Of

ODA 19.8

- Support for Data Guard
- Oracle Flex Redundancy Support for Oracle ACFS Disk Groups Using Browser User Interface
- Modify Database using the Browser User Interface or *odacli modify-database*
- Support for Standard Edition High Availability for Upgrade Database functionality in the Browser User Interface
- Access to Oracle Database Appliance documentation from the Browser User Interface
- odacli command enhancements
  - Creation and retention of jobs
  - View available disks and release disks
  - *odacli move-database* replaces *odacli update-database* (deprecated now)

Standard Edition 2 High Availability Mode

SE2 RAC Is No Longer Supported In 19c

- Starting with Oracle Database 19c Release Update (RU) **19.7**, you can install Oracle Database Standard Edition 2 in high availability mode.

- On the ODAs, the HA mode comes as a **default** feature

- With the **ODA 19.6 Release**, new single-instance Oracle Database 19c Standard Edition 2 databases created using the ODA command-line interface (*odacli*) or Browser User Interface (BUI) will have Standard Edition High Availability enabled by default (users can choose to disable it).
  - Existing Standard Edition RAC databases can be easily converted to single-instance databases prior to upgrading to Oracle Database 19c using *odacli*.

  - https://blogs.oracle.com/oda/standard-edition-high-availability-for-oracle-database-appliance

Integrated Oracle Data Guard Deployment

- Client interface through ODACLI for easy configuration and management of Oracle Data Guard (GUI is not supported)
- Supports databases versions
  - 11.2
  - 12.1
  - 12.2
  - 18c
  - 19c
- Support physical standby only (no snapshot or logical standby)
- Has to be same ODA configuration (HA to HA or Single-node to Single-node)
- Primary and standby systems must on the same ODA release
- Must be at least 19.8 ODA release or higher
- Database shape size need to be the same on primary and standby database
- ASM has to go to ASM, ACFS has to go to ACFS

ODA 19.9

- ***Most important*** feature is Oracle Linux KVM stack has now replaced OVM/Xen
- **Death** of oakcli and odacli will become the only tool to manage the ODA
- Virtualization runs on top of bare metal
- Support X8-2S and X8-2M now
- Still supports 11.2.0.4
- CPU Pools for bare metal and KVM
- odacli support TDE

ACFS Snapshot Clones

gDBClone

ORACLE

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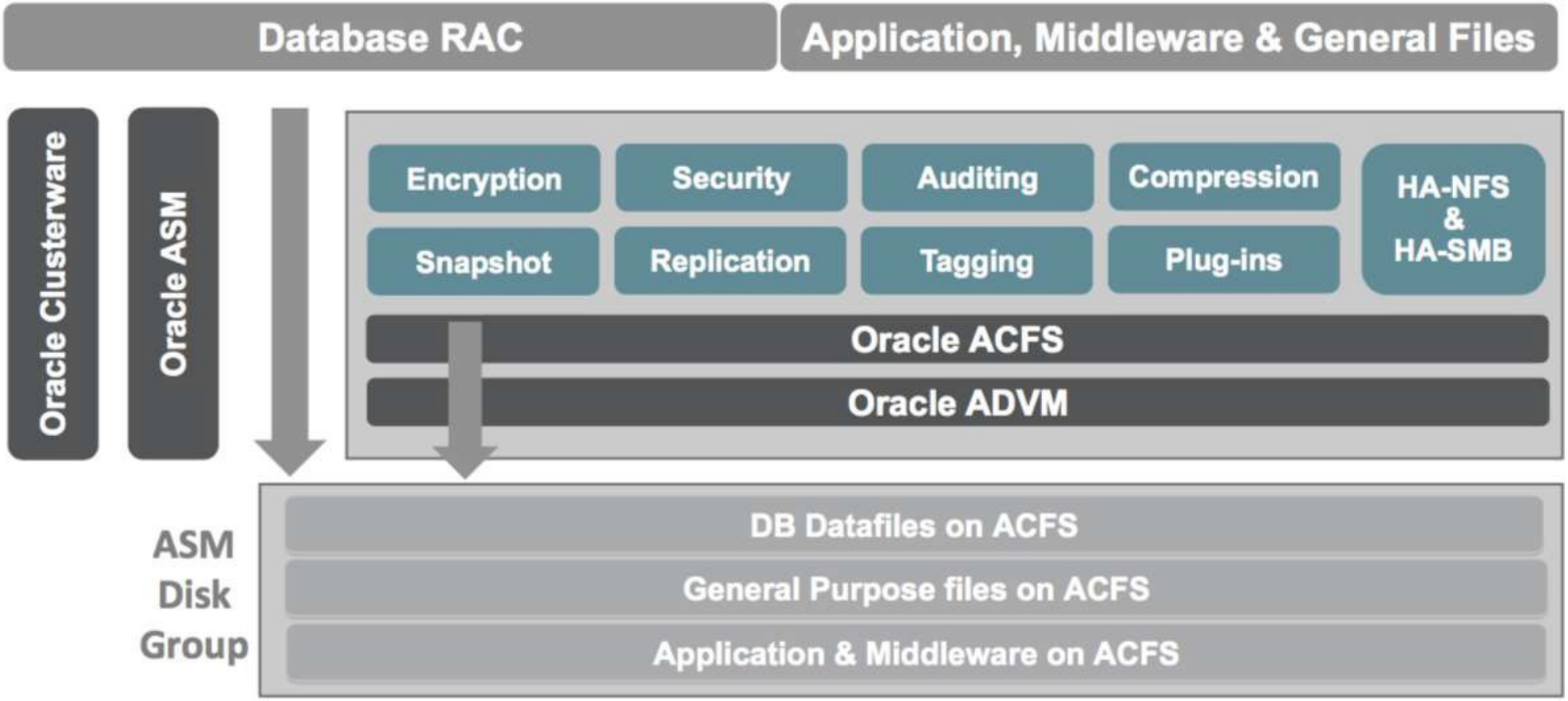
NORTH AMERICA

gDBClone 3.0.4

Generic Database Clone “onecommand Automation Tool”

Ruggero Citton
Oracle Product Development Architect
RACPack/MAA, Cloud Innovation and Solution Engineering Team

What is ACFS?


Database RAC
Application, Middleware & General Files
Oracle Clusterware
Oracle ASM
Encryption
Security
Auditing
Compression
HA-NFS & HA-SMB
Snapshot
Replication
Tagging
Plug-ins
Oracle ACFS
Oracle ADVM
ASM Disk Group
DB Datafiles on ACFS
General Purpose files on ACFS
Application & Middleware on ACFS

ACFS Snapshot Clone

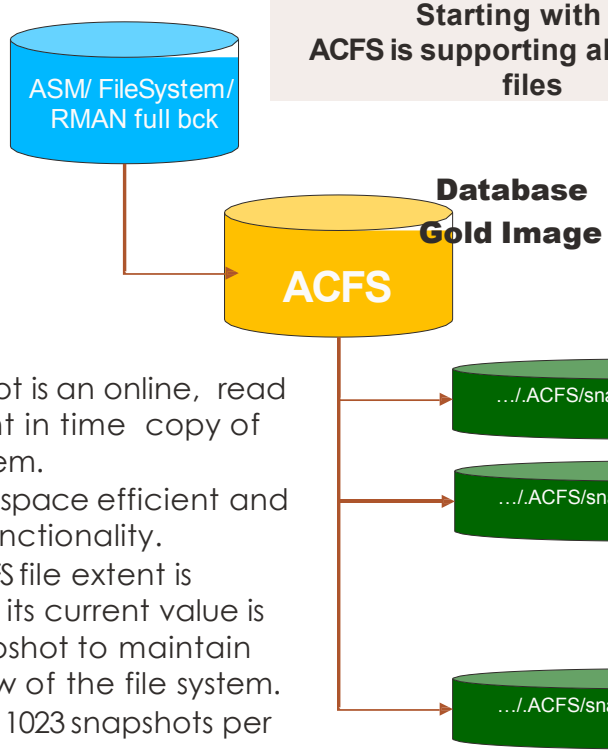
- Never realized that we had so many customers running databases on ACFS
- Have a customer who has hundreds of databases on ACFS
- On each M, has over 25 databases running on ACFS

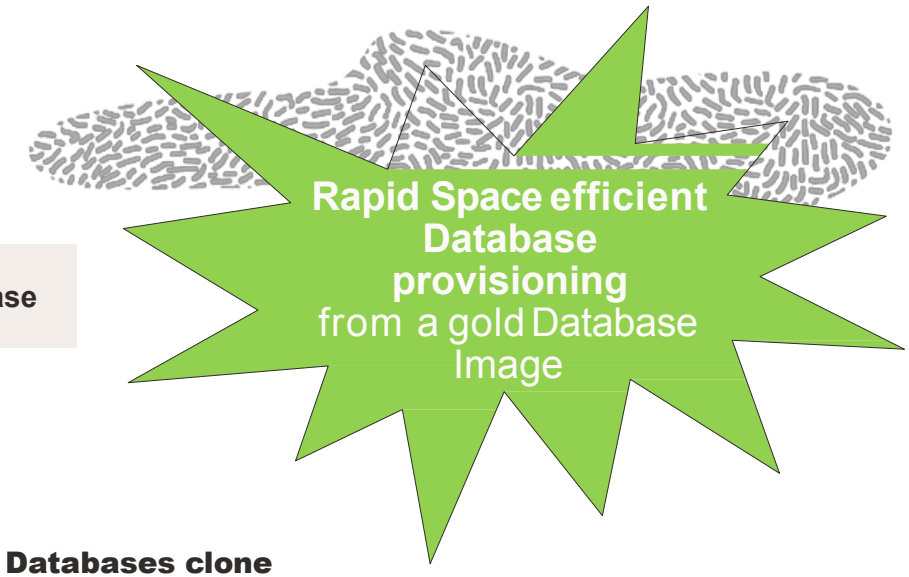
gDBClone Powerful Database Clone/Snapshot Management Tool (Doc ID 2099214.1)

gDBClone

Database Clone ASM/ACFS / snapshot

RMAN Duplicate Database (physical copy)





An Oracle ACFS snapshot is an online, read only or read write, point in time copy of an Oracle ACFS file system.

- The snapshot copy is space efficient and uses Copy On Write functionality.
- Before an Oracle ACFS file extent is modified or deleted, its current value is preserved in the snapshot to maintain the point in time view of the file system.
- Oracle ACFS supports 1023 snapshots per file system

gDBClone Intro

- RPM based Download-able script to create clone, snapshots, etc
  - https://www.oracle.com/downloads/samplecode/gdbclone-samplecode-downloads.html
  - gDBClone-3.0.2-119.noarch.rpm

- gDBClone was developed to provide a simple and efficient method for cloning a database for test and dev environments.
  - Leverages ACFS snapshot functionality to create space efficient databases copies
  - Manage a test and dev database life cycle.
  - Extra features - create Data Guard [Active]

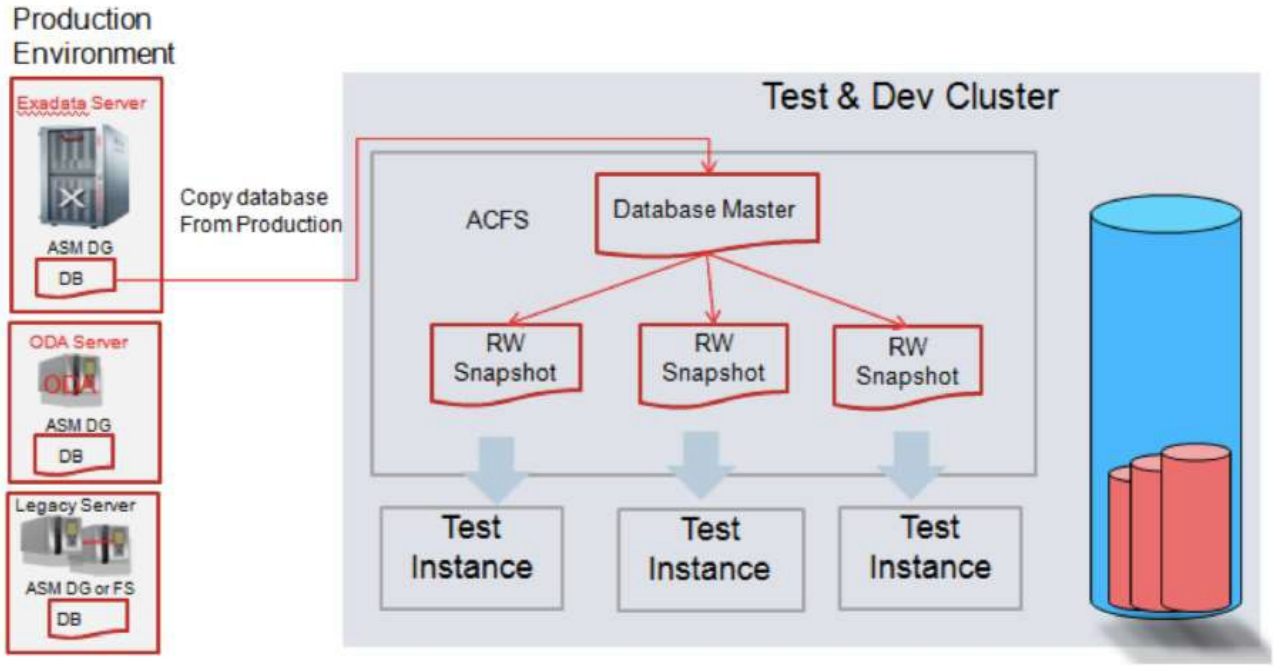
gDBClone Intro

Key gDBClone functions:

- Clone : Creates a clone database (as Primary or Standby) from a production database copying the DB to the target test and dev cluster
- Snap : Creates sparse snapshots of the DB to be used for test and development
- Convert : Converts a given database to RAC, RAC One, or from non - CDB (non - container database) to a PDB (pluggable database) of a given CDB
- ListDB/DelDB : Lists or Delete the cloned databases and its snapshots
- SYSPwF : Creates an encrypted password file

gDBClone Intro

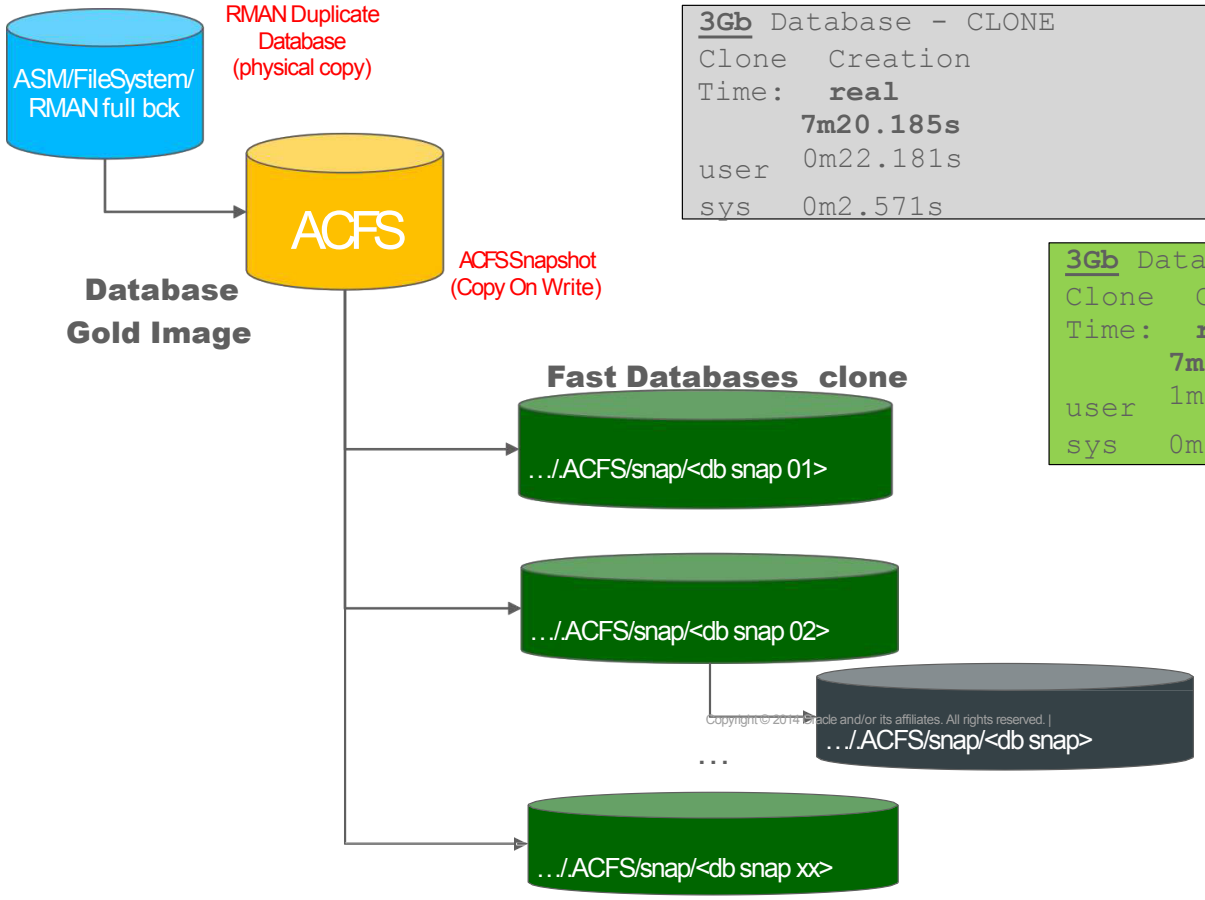
- Initial copy of a production database is created/copied onto a Test/Dev environment as a master copy.
- This is clone copy can be a point-in-time (**PIT**) copy OR an Active Data Guard (**ADG**) copy
- Perform **post-clone** processing as needed - Data scrubbing, data filtering, redaction



gDBClone - Snap/Clone

- Effectively using "RMAN **Duplicate** from Active Database" under the covers
- By default gDBClone is allocating **3** RMAN channels, overwrite it using " -channels
  - <RMAN channels number> " command option) .
- The source of snapshot database must be stored on local ACFS filesystem.
  - The number of snapshots is limited only by ACFS snapshot limits
- The snapshot DB will reside inside the source DB location under **.ACFS** directory
- gDBClone supports the snapshot of a running Standby database without production impact leveraging on the "**Snapshot** Standby " database feature.

Database Clone ASM/ACFS/snapshot (creation time)



3Gb Database - CLONE

```
Clone   Creation
Time:   real
        7m20.185s
user    0m22.181s
sys     0m2.571s
```

60Gb Database

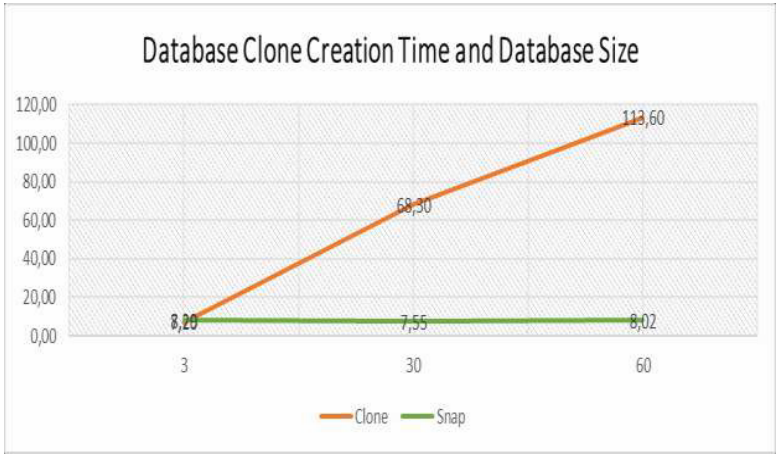
```
Clone   Creation
Time:   real
113m5.63s
user    0m22.849s
sys     0m3.326s
```

3Gb Database

```
Clone   Creation
Time:   real
        7m28.923s
user    1m6.842s
sys     0m13.564s
```

60Gb Database

```
Clone   Creation
Time:   real
        6m55.560s
user    1m0.655s
sys     0m14.428s
```



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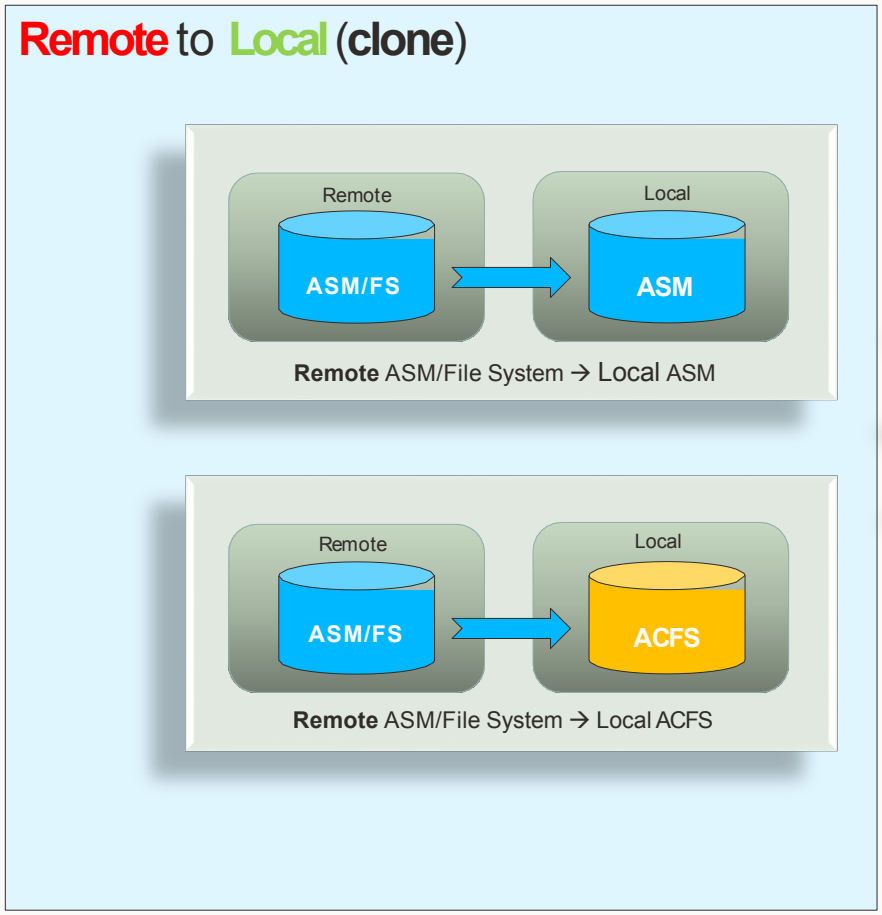
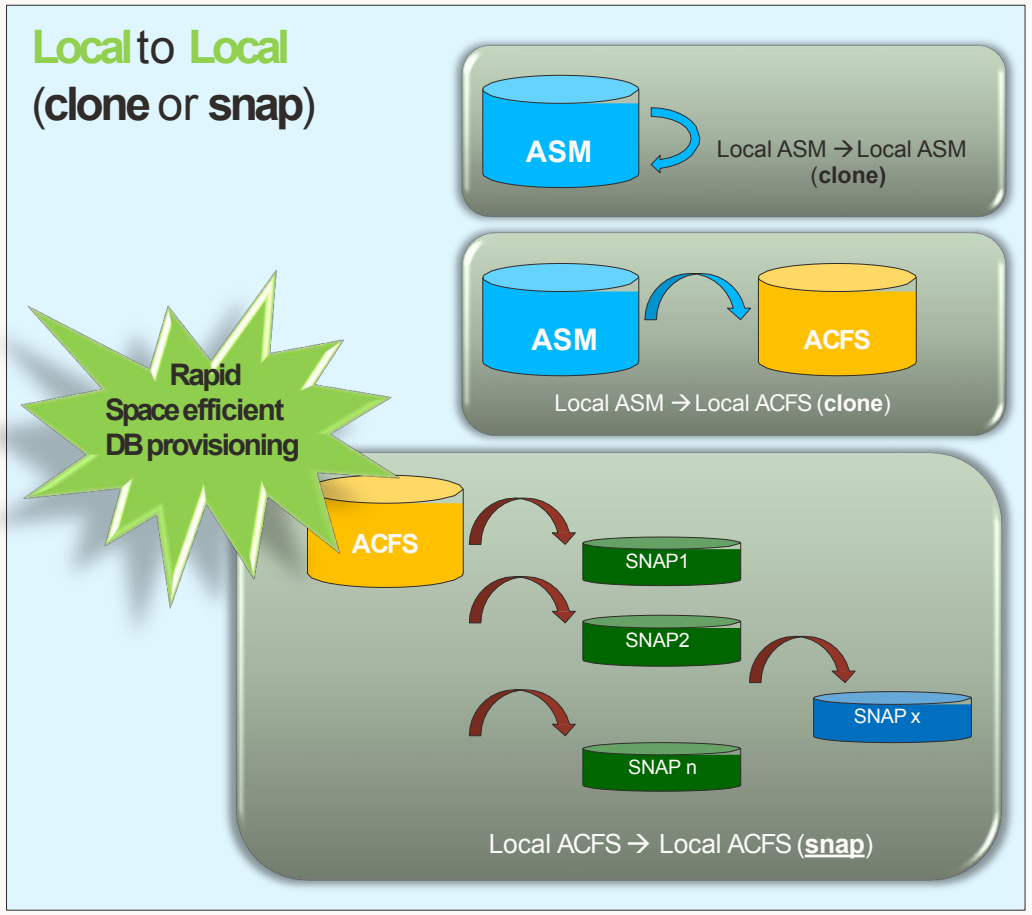
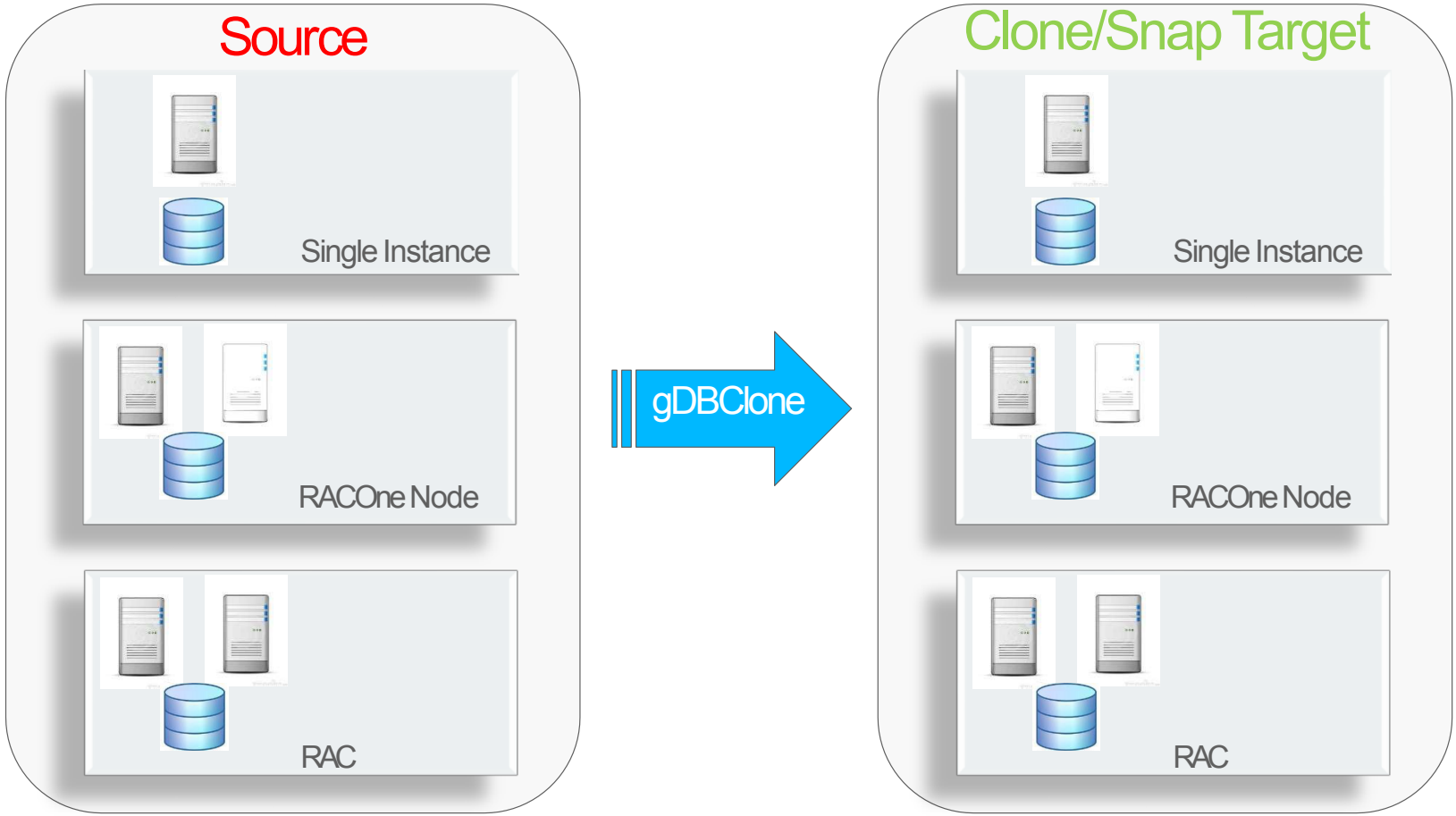
Database Clone/Snap – Remote source DB vs Local source DB



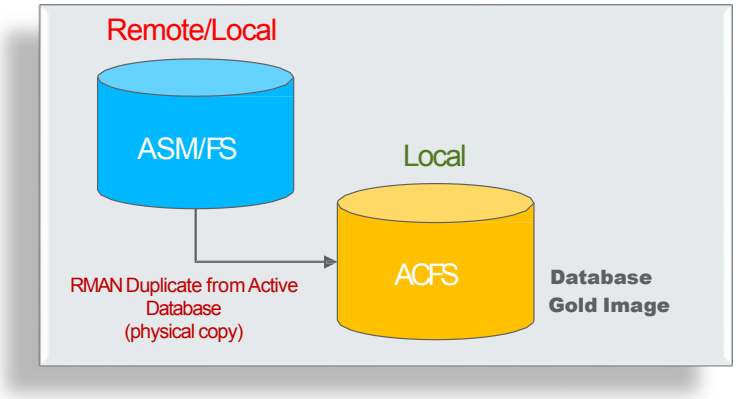


DB Clone/Snap – Database Type Support



gDBClone Clone onecommand Example

Clone a Remote/Local database to ACFS (GoldImage)



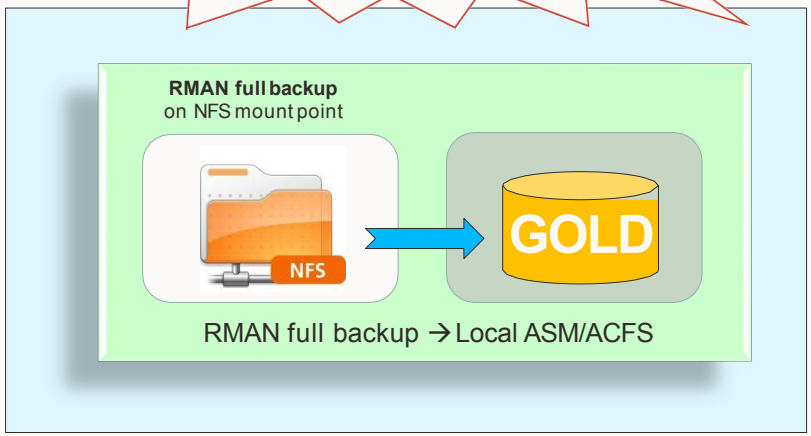

```
# ./gDBClone clone -sdbname vnadb -sdbhost oda1.vna.com \
-tdbname vnagold -dataacfs /data -redoacfs /redo -recoacfs
/reco
```

gDBClone

Database Clone from RMAN full backup

- Avoid source production database connections
- Clone from a given RMAN full backup location
- The RMAN full backup can be on NFS

Since v. 3.0.2-56 **until time** is possible



Note:
due to Bug 16740594
– 121 requires backend nfs server to export the FS with the 'insecure' option

i.e.:
cat /etc/exportfs
/mnt/backup 10.208.166.10(rw,sync,**insecure**)

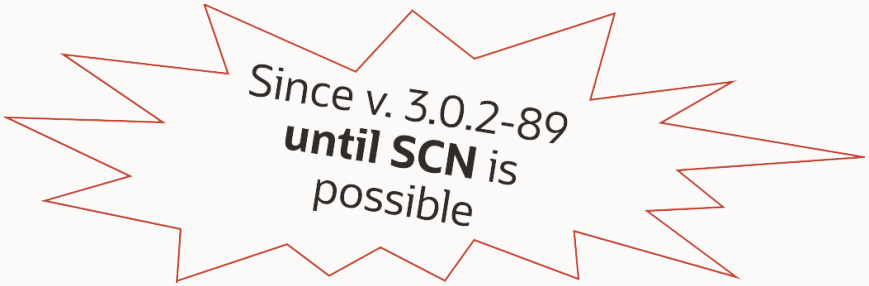
Example of RMAN full backup command:

```
RUN
{
ALLOCATE CHANNEL disk1 DEVICE TYPE DISK FORMAT '/mnt/backup/<SOURCE_DB>/%U';
BACKUP DATABASE PLUS ARCHIVELOG;
BACKUP AS COPY CURRENT CONTROLFILE FORMAT '/mnt/backup/<SOURCE_DB>/control_%U';
BACKUP SPFILE FORMAT '/mnt/backup/<SOURCE_DB>/spfile_%U';
}
```

gDBClone

Database Clone using RMAN catalog (3.0.2-81)

- Avoid source production database connections
- Clone from Tape RMAN backup
- Clone from Zero Data Loss Recovery Appliance

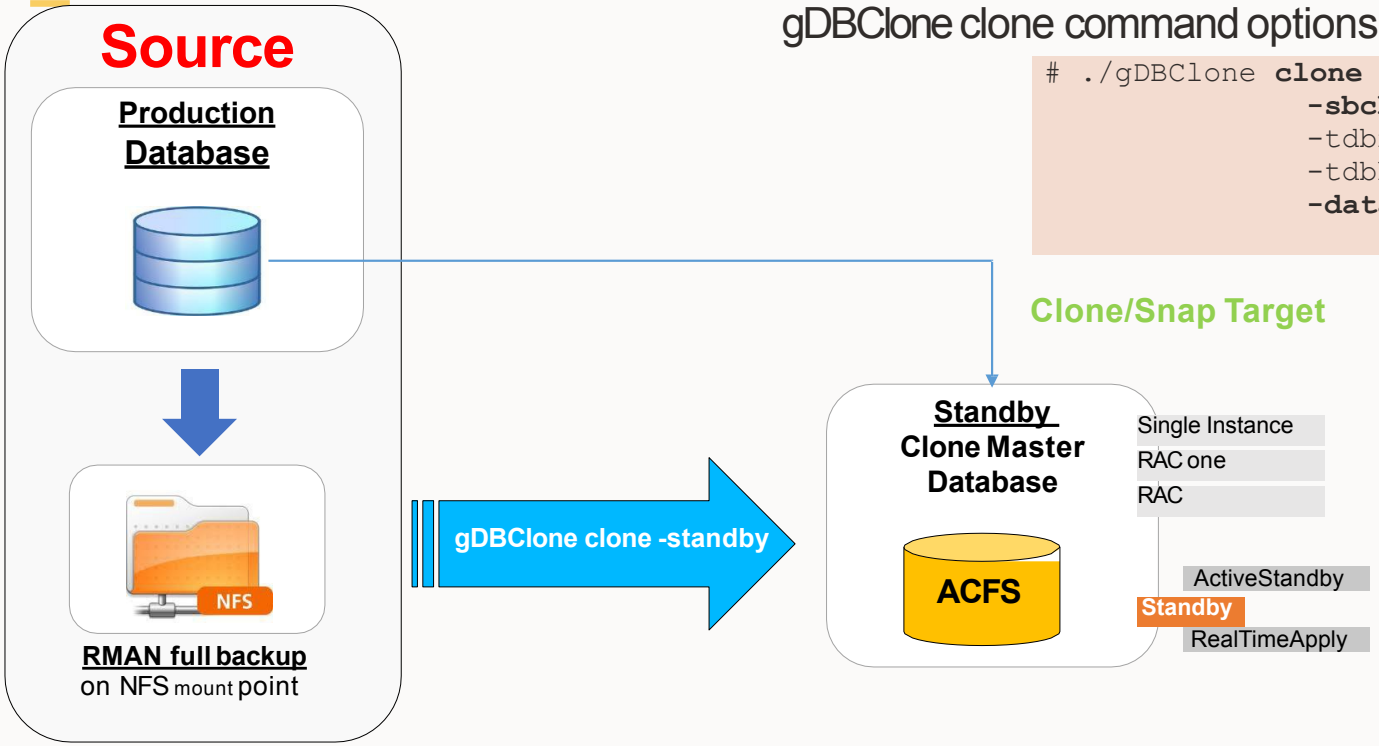


Example of gDBClone command:

```
gDBClone clone -sdbname ORCL-tdbname CAT-tdbhome OraDb12201_home1 \
  -dataacfs /u02/app/oracle/oradata/datastore \
  -redoacfs /u01/app/oracle/oradata/datastore \
  -recoacfs /u01/app/oracle/fast_recovery_area/datastore \
  -catuser rman -cstring slcac458-scan/CATALOG -scn 413062 -dbid 1508953252 \
  -sbt "SBT_LIBRARY=/u01/oracle/product/12.1.0.2/dbhome_1/lib/libra.so,ENV=(RA_WALLET=location=file:/u01/oracle/product/12.1.0.2/dbhome_1/db
s/racredential_alias=ra-scan:1521/zdlra5:dedicated)"
```

gDBClone **clone** onecommand examples

Clone a database from an RMAN full backup to ACFS as a standby DB



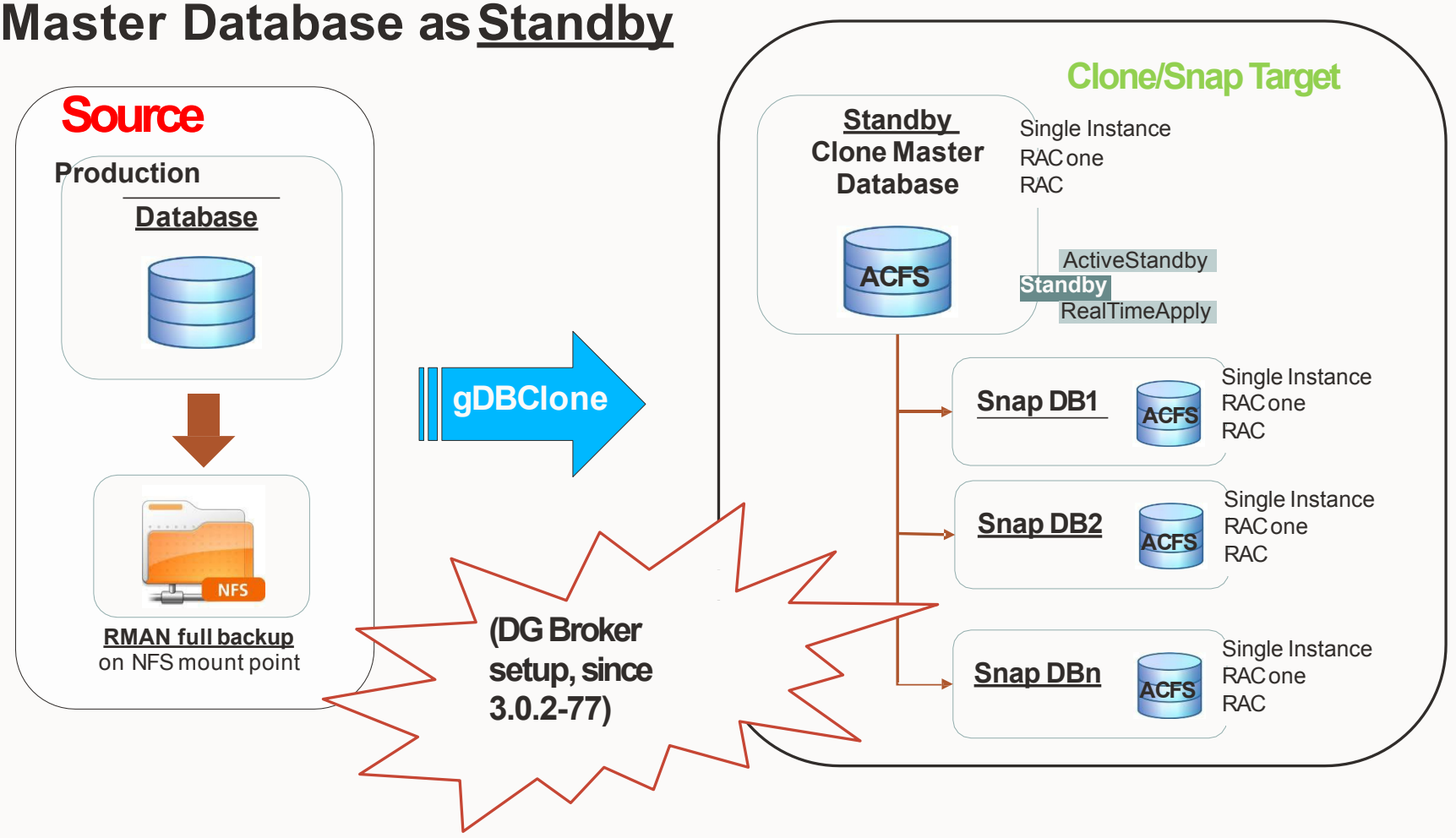
gDBClone clone command options:

```
# ./gDBClone clone -sdbname ORCL -sdbscan myscan
                   -sbckloc /NFS/backup/ORCL \
                   -tdbname GOLD \
                   -tdbhome OraDb19000_home1 \
                   -dataacfs /cloudfs \
                        -standby
```

Clone/Snap Target

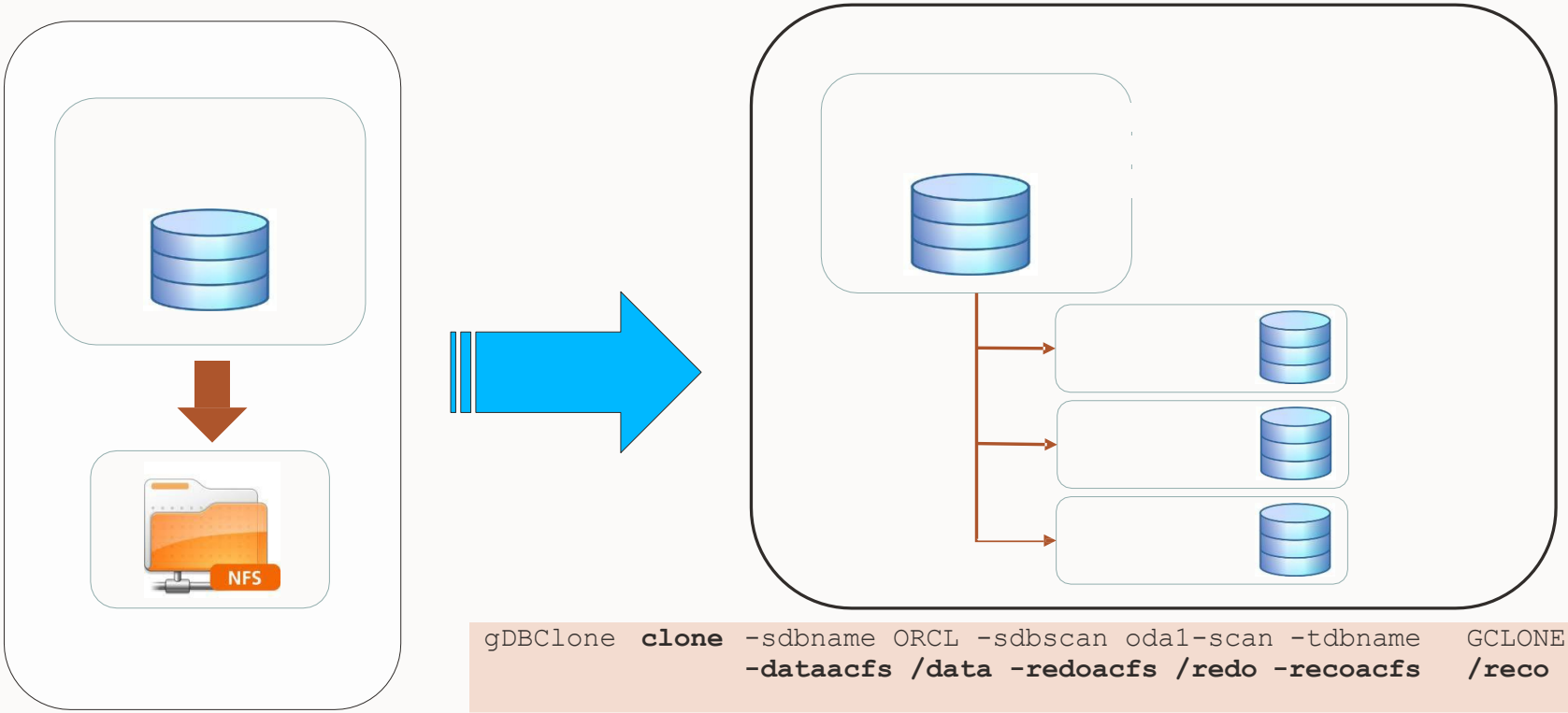
gDBClone

Clone Master Database as Standby



gDBClone

Multiple Target ACFS/ASM for data,redo,reco

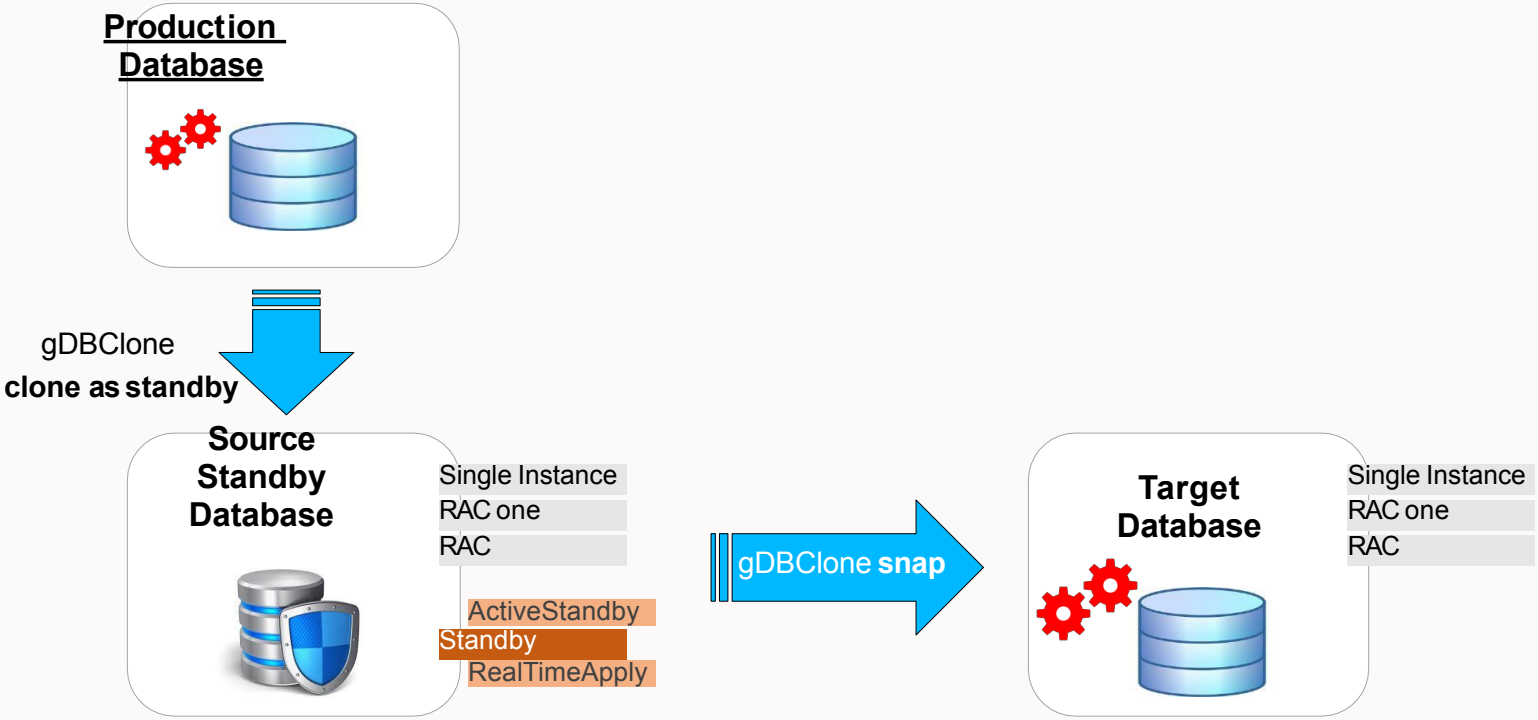



```
gDBClone  clone  -sdbname ORCL -sdbscan oda1-scan -tdbname   GCLONE \
                 -dataacfs /data -redoacfs /redo -recoacfs   /reco

gDBClone  clone  -sdbname ORCL -sdbscan oda1-scan -tdbname   GCLONE \
                 -datadg +DATA -redodg +REDO -recodg +RECO
```

gDBClone

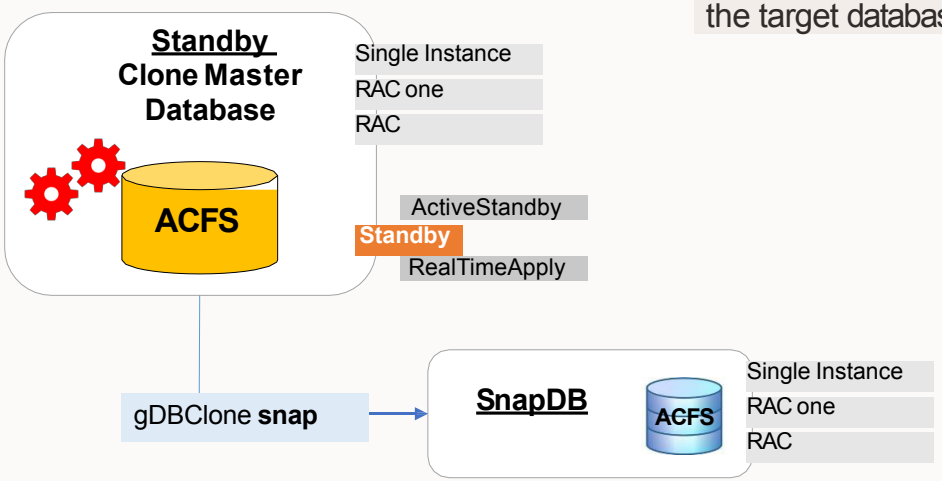
Clone a Standby Database



gDBClone

Create a snapshot RAC database from local standby database

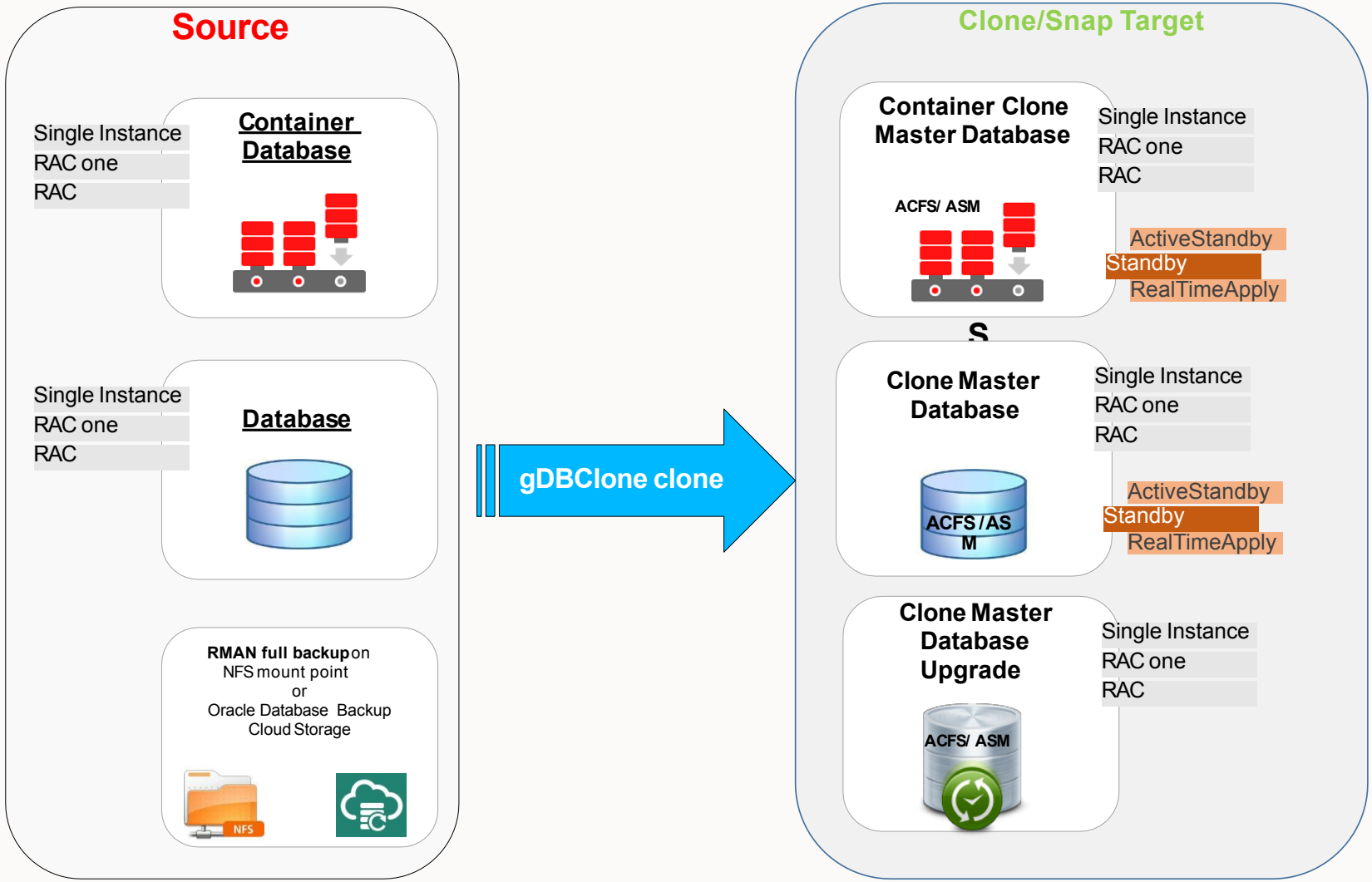
Note:
the target database name is also the ACFS snapshot name



gDBClone clone command options:

```
# ./gDBClone snap -sdbname GOLD -tdbname CS0 -racmod 2
```

gDBClone Summary



DB Clone/Snap – Overwriting pfile parameters

- If you need to decrease/increase the SGA footprint
- If your target local system cannot accommodate the source SGA
- Leverage on
  - "-sga_max_size" and "- sga_target
  - "-pfile" option

```
 aq_tm_processes
archive_lag_target
bitmap_merge_area_size
create_bitmap_area_size
db_block_checking
db_block_checksum
db_file_multiblock_read_count
db_files
db_lost_write_protect
fast_start_parallel_rollback
hash_area_size
job_queue_processes
log_archive_format
log_archive_max_processes
log_archive_trace
open_cursors
 parallel_execution_message_size
```

```
 parallel_max_servers
pga_aggregate_target
processes
recovery_parallelism
remote_login_passwordfile
sec_case_sensitive_logon
session_cached_cursors
sessions
 sga_max_size
sga_target
 shared_pool_reserved_size
shared_pool_size
shared_servers
sort_area_retained_size
sort_area_size
undo_management
undo_retention
```

Managing gDBClone Privileges and Security with SUDO

- gDBClone command-line utility requires root system privileges for most actions.
- Viscosity strongly recommends that ALL customers leverage SUDO as part of your system auditing and security policy.

Harnessing The Power of gDBClone

Customer Case Study

- Space constraints
  - Very little
  - Master Database (GOLD - 1.2 TB)
  - Snapshot Database (TRAIN - 200 GB)
- Time Constraints
  - Once Master database is created, creating a snapshot database is lightning fast (approximately 8 minutes)
- Refresh Frequency
  - Easily fulfill business and development refresh requirements

Summary gDBClone

- Integrated database cloning solution in "one command"
  - No skills necessary
- Automatic tool to duplicate **SI/RACOne/RAC to SI/RACOne/RAC** from ASM/ACFS/filesystem to ACFS(or ASM) **without** specific knowledge/skills
- Test/Dev database environment creation in one click
- "one command" for Daguard/Standby setup w/o downtime and **without** storage duplication when "snap" option is in use
- "one command" to get a snapshot database from standby database
- "one command" to convert a database to RAC/RACone without specific knowledge/skills
- "one command" to convert a non-CDB database to PDB without specific knowledge/skills
- gDBClone could be the "**killer**"for **Transient** Logical Standby Upgrades
- (gDBClone) database snapshot as standby without downtime and without storage duplication

ODA Lab

gDBClone

gDBClone
Clone option

```
Usage:
gDBClone clone
          -sdbname <source DB name>
          -sdbscan <source DB Host SCAN name>
         |-sbckloc '<backup location path>' [-time <DD-MON-YYYY_HH24:MI:SS>] [-upgrade [-parallel <number of process>]]
         |-sopcbck
           {-opclib '<opc_lib_path>' -opcpfile '<opc_pfile_path' [-rmanpwf <rman password file>]  [-
           upgrade [-parallel <number of process>]]}
         |-catuser <catalog user> [-catpwf <rman catalog password file>] -cstring <connect string>
           [-scn <scn>][-dbid <database ID>][-sbt1 <sbt params>][-sbt2 <sbt params>]
          -tdbname <Target Database Name> [-tdomain <Target Database Domain Name>] -tdbhome <Target Database Home Name>
          -dataacfs <acfs mount point> [-redoacfs <acfs mount point> ] [-recoacfs <acfs mount point>]
         |-datadg <asm data diskgroup> [-redodg <asm redo diskgroup> ] [-recodg <asm reco diskgroup>]}
         [-sga_max_size <size Mb> ] [-sga_target <size Mb>] | [-pfile <path>]
         [-channels <RMAN channels number> ] [-ssize <size Mb>] [-cbset]
         [-sdbport <Source DB SCAN Listener Port>] [-tdbport <Target DB SCAN Listener Port>]  [-
         standby [-pmode maxperf|maxavail|maxprot] [-activedg] [-rtapply]
           [-dgbroker [-dgbpath1 <dgb config path>][-dgbpath2 <dgb config path>]]]
         [-racmod <db type> ]
         [-oci ] [-noping]
         [-resume]
         [-syspwf <sys password file>]
```

gDBClone
Snap option

```
gDBClone snap    -sdbname <source DB name> -tdbname <Target Database Name>
                   [ -tdbhome <Target Database Home Name> ]
              [ -sga_max_size <size Mb> ] [ -sga_target <size Mb> ] | [ -pfile ]
              [ -standby [-pmode maxperf|maxavail|maxprot] [-activedg] [-rtapply] [-dgbroker] ]  [ -
              sdbport <SCAN Listener Port> ]
              [ -racmod <db type> ]
```

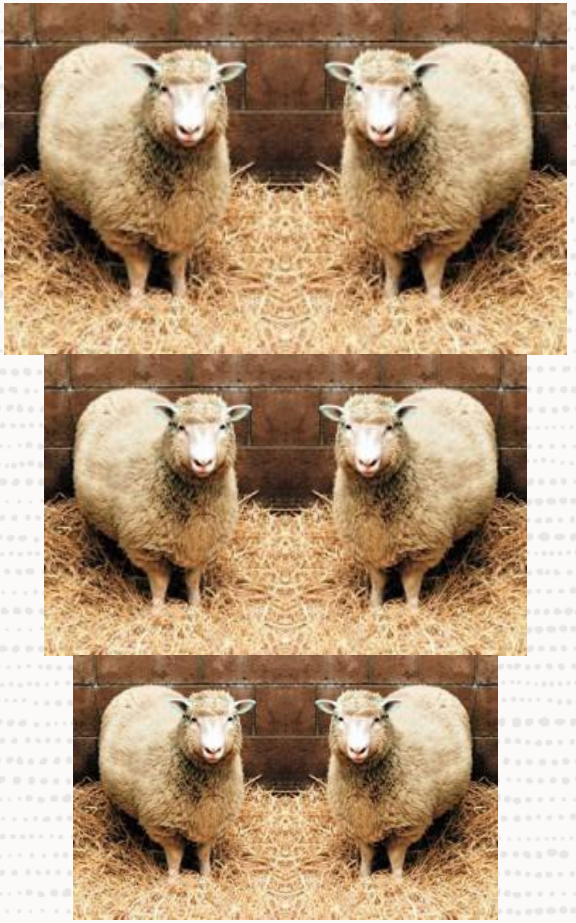
gDBClone
Convert option

```
gDBClone convert -sdbname <source noCDB name>
                  -racmod <1|2> | -tdbname <target CDB name> [-check] {[-copy] [-path <path>]}  [ -
               syspwf <sys password file>] [ -tsyspwf <sys password file>]
```

- Convert to RAC or RACOne(*)
- Convert a non CDB to a PDB of a given CDB

(*)Undocumented “-rconfing” option: to force the “rconfig” tool to make a RAC/RACOne conversion

gDBClone
Convert Option



gDBClone
Convert option

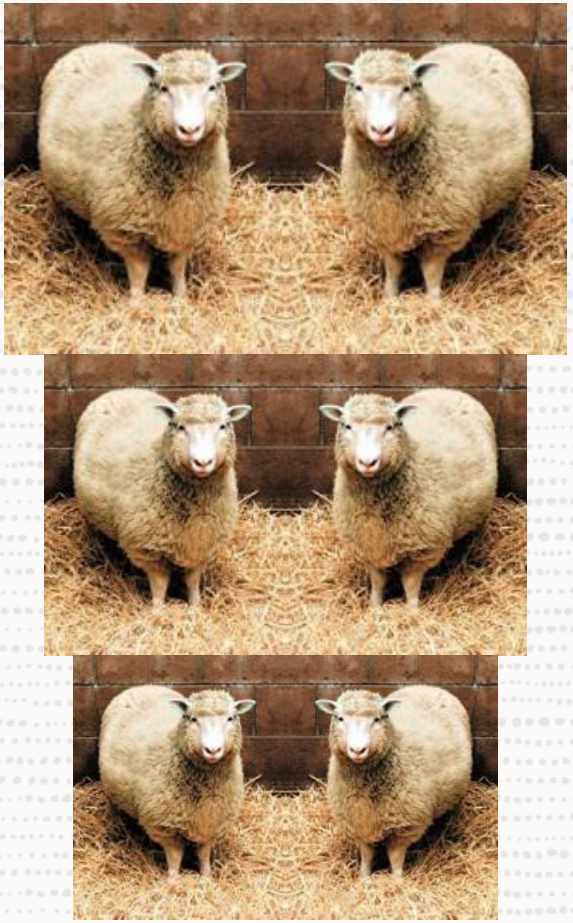
```
gDBClone convert -sdbname <source noCDB name>
                  -racmod <1|2> | -tdbname <target CDB name> [-check] {[-copy] [-path <path>]}  [ -
               syspwf <sys password file>] [ -tsyspwf <sys password file>]
```

- Convert to RAC or RACOne(*)
- Convert a non CDB to a PDB of a given CDB

(*)Undocumented “-rconfing” option: to force the “rconfig” tool to make a RAC/RACOne conversion

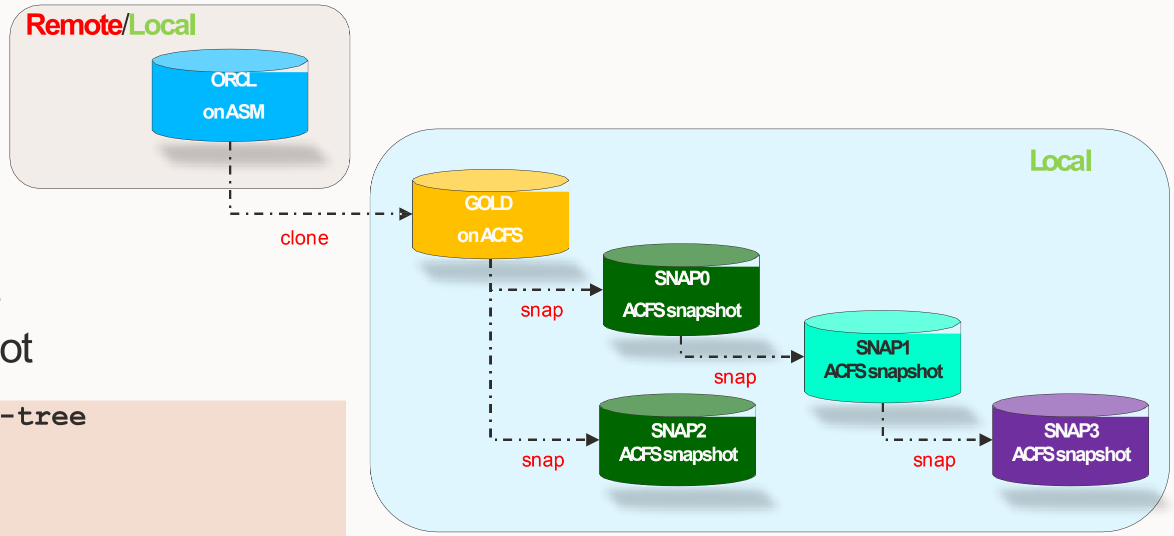
gDBClone

listhomes, listdbs & deldb Options



gDBClone listdb

➢gDBClone ***listdbs*** [-tree] | [-verbose] provides the ability to list the database and the storage type ASM, ACFS filesystem, ACFS snapshot with parent snapshot




```
# ./gDBClone listdbs -tree
Parent    Child
------    -----
GOLD
          SNAP2
          SNAP0
                         SNAP1
                                   SNAP3
```

```
# ./gDBClone listdbs -verbose
```

Database Name	Database Type	Database HomeLocation	Database Version	Database Role	Location/Parent
SNAP2	RACOneNode	/u01/app/oracle/product/12.1.0/dbhome_1	12.1.0.1.0	Snapshot	GOLD
GOLD	RAC	/u01/app/oracle/product/12.1.0/dbhome_1	12.1.0.1.0	Master	/cloudfs/.ACFS/snaps
SNAP3	RACOneNode	/u01/app/oracle/product/12.1.0/dbhome_1	12.1.0.1.0	Snapshot	SNAP1
SNAP0	SINGLE	/u01/app/oracle/product/12.1.0/dbhome_1	12.1.0.1.0	Snapshot	GOLD
SNAP1	SINGLE	/u01/app/oracle/product/12.1.0/dbhome_1	12.1.0.1.0	Snapshot	SNAP0

gDBClone **listdb a more complexexample:**

```
# ./gDBClone listdbs
Database Name      Database Type     Database Role      Master/Snaphot      Location/Parent
-------------      -------------     -------------      ---------------     ----------------
SNAP0              SINGLE            PRIMARY            Snapshot            GOLD
lcsnap2            SINGLE            PRIMARY            Snapshot            lcsnap1
SNAP3              RACOneNode        PRIMARY            Snapshot            SNAP1
lcsnap1            SINGLE            PRIMARY            Snapshot            lcgold
SNAP4              SINGLE            PRIMARY            Snapshot            SNAP3
lcsnap0            SINGLE            PRIMARY            Snapshot            lcgold
SNAP2              RACOneNode        PRIMARY            Snapshot            GOLD
SNAP5              SINGLE            PRIMARY            Snapshot            SNAP1
lcgold             SINGLE            PRIMARY            Master              /acfs/.ACFS/snaps
GOLD               RAC               PHYSICAL_STANDBY   Master              /cloudfs/.ACFS/snaps

SNAP1              SINGLE            PRIMARY            Snapshot            SNAP0
```

Master Database cloned as Standby database

```
# ./gDBClone listdbs -tree

Parent        Child
------        -----
lcgold

              lcsnap1

                                lcsnap2
              lcsnap0

Parent        Child
------        -----
GOLD

              SNAP0
              SNAP1
                                SNAP3
                                                SNAP4
                              SNAP5
                              SNAP2
```

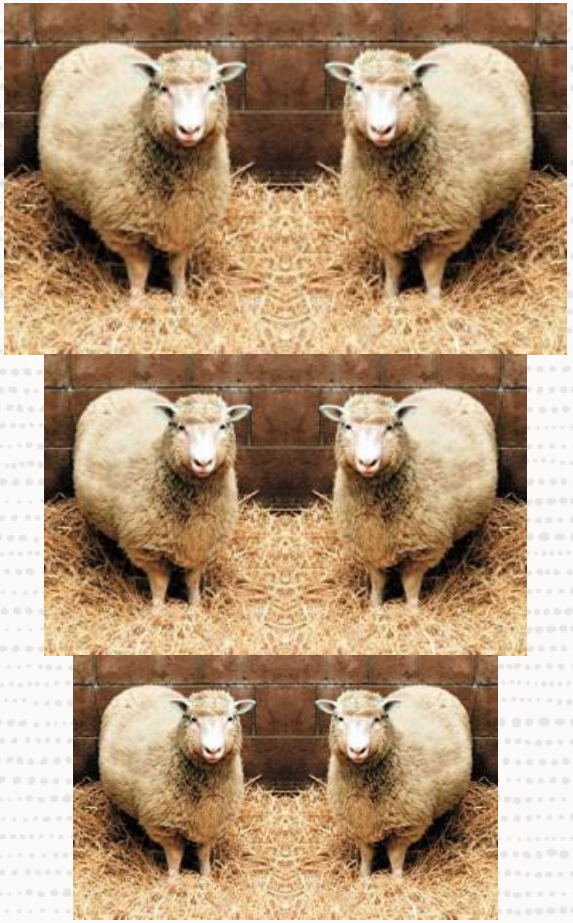
gDBClone **deldb**

- gDBClone ***deldb*** provides the ability to delete a database and if running on ACFS snapshot, it will remove the related snapshot as well

```
# ./gDBClone deldb
Usage:
gDBClone deldb -tdbname <database name> [ -force ]
 Examples:
        # ./gDBClone deldb -tdbname SNAP3
You are going to drop the database SNAP3, are you sure (Y/N)? y
Connecting to database
4% complete
9% complete
14% complete
19% complete
23% complete
28% complete
47% complete
Updating network configuration files
52% complete
Deleting instance and datafiles
76% complete
100% complete
Look at the log file "/u01/app/oracle/cfgtoollogs/dbca/SNAP32.log" for further details.
acfsutil snap delete: Snapshot operation is complete.
ACFS snapshot SNAP3 on /cloudfs ACFS file system has been deleted.
```

gDBClone

listsnaps & delsnap Options



gDBClone **listsnaps**

- gDBClone ***listsnaps*** provides the ability to list the available snapshot for a given ACFS mount point.

- With '-**tree**' option will display the snapshot family tree

```
# ./gDBClone listsnaps -acfs /cloudfs -tree
/cloudfs                  RW
SNAP0                     RW    /cloudfs
SNAP2                     RW    /cloudfs
SNAP1                     RW    SNAP0
SNAP3                     RW    SNAP1
```

```
# ./gDBClone listsnaps
Usage:
gDBClone listsnaps -acfs <acfs_mount_point> [ -tree ]

  Examples:
# ./gDBClone listsnaps -acfs /cloudfs
snapshot name:                SNAP0

RO snapshot or RW snapshot:   RW
parent name:                  /
snapshot          time:       cloudfs  3 17:00:30 2013
creation                      Tue Sep
snapshot name:    snapshot    SNAP
RO snapshot or                1
RW  parent name:  :  time:    RW
snapshot                      SNAP      3 17:23:16 2013
creation                      0
                              Tue Sep
snapshot name:    snapshot    SNAP
RO snapshot or                2
RW  parent name:  :  time:    RW
snapshot                      /         3 18:43:48 2013
creation                      cloudfs
    number of snapshots:  3   Tue Sep
    snapshot space usage: 16508289024
```

gDBClone **delsnap**

- gDBClone ***delsnap*** provides the ability to delete a given snapshot for a given ACFS mount point

```
# ./gDBClone delsnap
Usage:
gDBClone delsnap -snapname <snapshot name> -acfs <acfs_mount_point>

 Examples:
       # ./gDBClone delsnap -snapname CS0 -acfs /cloudfs
       acfsutil snap delete: Snapshot operation is complete.
```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