



**EXPLORING
ALL OPTIONS
TO MOVE
YOUR ORACLE
DATABASES
TO THE ORACLE CLOUD**



**Alex
Zaballa**

accenture > **technology**

ALEX ZABALLA



ORACLE
ACE Director

CHRISTIAN, HUSBAND, FATHER, DBA, ACE DIRECTOR, WRITER AT OTN, SPEAKER AND BLOGGER.

| | | | | | | | | |
|--|--|--|--|---|---|---|--|---|
| ORACLE Certified Master Oracle Database 12c Administrator | ORACLE Certified Professional Oracle Application Server 10g Administrator | ORACLE Certified Expert Oracle Database 11g Performance Tuning | ORACLE Certified Professional Oracle Database 11g Administrator | ORACLE Certified Associate Oracle Database Cloud Service Operations | ORACLE Certified Associate Oracle WebLogic Server 11g System Administrator | ORACLE Certified Professional Database Cloud Administrator | ORACLE Certified Professional Oracle Forms Developer | ORACLE Certified Expert Oracle Database 12c: Oracle RAC and Oracle Grid Infrastructure Administrator |
| ORACLE Certified Master Oracle Database 12c Maximum Availability Architecture | ORACLE Certified Specialist | ORACLE Certified Professional Oracle Forms Developer 11g | ORACLE Certified Expert Oracle Database SQL | ORACLE Certified Associate Oracle Linux 5 and 6 System Administrator | ORACLE Certified Professional Oracle Database 12c Administrator | ORACLE Certified Expert Oracle Database 10g Managing Oracle on Linux | ORACLE Certified Expert Oracle Database 11g Release 2 SQL Tuning | ORACLE Certified Expert Oracle Database 12c Maximum Availability Architecture |
| ORACLE Certified Master Oracle Database 11g Administrator | ORACLE Certified Associate Oracle Database 10g Administrator | ORACLE Certified Expert Oracle Application Express Developer | ORACLE Certified Professional Oracle Database Cloud Administrator | ORACLE Certified Professional Advanced PL/SQL Developer | ORACLE Certified Associate Oracle Linux Administrator | ORACLE Certified Expert Oracle Real Application Clusters 11g and Grid Infrastructure Administrator | ORACLE Certified Expert Oracle Database 12c Data Guard Administrator | |
| ORACLE Certified Master Database Cloud Administrator | ORACLE Certified Expert Oracle Exadata X3 and Oracle Exadata X4 Administrator | ORACLE Certified Professional Oracle Database 10g Administrator | ORACLE Certified Expert Oracle WebLogic Server 10g System Administrator | ORACLE Certified Associate Oracle Application Server 10g Administrator | ORACLE Certified Expert Oracle Real Application Clusters 10g Administrator | ORACLE Certified Expert PartnerNetwork Certified Specialist | ORACLE Certified Expert Oracle Database 12c Performance Management and Tuning | |

325 – Including OPN



<http://alexzaballa.blogspot.com/>

@alexzaballa

<https://www.linkedin.com/in/alexzaballa>



- Based in Dallas-TX (June, 2019 - Now)
- Worked for **3** years in **Brazil** as a Clipper/Delphi Developer (15 years old) 1997-1999
- Worked for **7** years in **Brazil** as an **Oracle Developer** 2000 – 2007
- Worked for **8** years in **Angola - Africa** as an **Oracle DBA** for the **Ministry of Finance**. 2007 – 2015
- Worked for **4** years in **Brazil** as an **Oracle DBA** for Accenture Enkitech Group. 2015 – 2019 (June,2019)

ACCENTURE ENKITEC GROUP

CAPABILITIES OVERVIEW



ELITE

- Global systems integrator focused on the Oracle platform
- Consultants average 15+ years of Oracle experience
- Worldwide specialist in Engineered Systems implementations
- 14 Oracle ACE members, specialist recognized by Oracle for their technical expertise



EXPERTISE

ORACLE SPECIALIZATIONS*

- Oracle Exadata
- Oracle Database
- Oracle Data Integrator
- Oracle Data Warehouse
- Oracle Performance Tuning
- Oracle Exalogic
- Oracle GoldenGate
- Oracle Database
- Oracle Real Application Cluster
- Oracle Database Security

ORACLE ENGINEERED SYSTEMS NUMBERS

- 700+ Oracle Engineered Systems which AEG have configured, patched or supported.
- 100+ AEG resources which have an average 15+ years of Oracle experience
- AEG Support across 9 countries
- 200 Oracle Engineered Systems (Exadata/Exalogic etc) currently under management directly by AEG
- 200+ customers in either the AEG Managed Services program or remote DBA program
- 50,000 Accenture Oracle IDC resources that can be leveraged for Level 1 & Level 2 support



SUCCESS



THOUGHT LEADERSHIP

Our consultants have been published in multiple subject areas and additional online resources that demonstrate Accenture's experience and expertise with the OES platform

500+ TECHNICAL EXPERTS HELPING PEERS GLOBALLY



ORACLE®
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3 MEMBERSHIP TIERS

- Oracle ACE Director
- Oracle ACE
- Oracle ACE Associate

bit.ly/OracleACEProgram

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

ORACLE DATABASE CLOUD

CLOUD 101



ON PREMISES



ORACLE CLOUD

**SAME ARCHITECTURE
SAME SOFTWARE
SAME SKILLS**

ORACLE DATABASE 18C/19C/20C ARE NOT AUTONOMOUS DATABASE

Autonomous Database:

It's a **cloud service** that happens to use the Oracle 18c/19c database.

Oracle Database 18c/19c:

It's not autonomous!

<https://oracle-base.com/blog/2018/01/03/oracle-database-18c-is-not-an-autonomous-database/>



Will I lose my job?

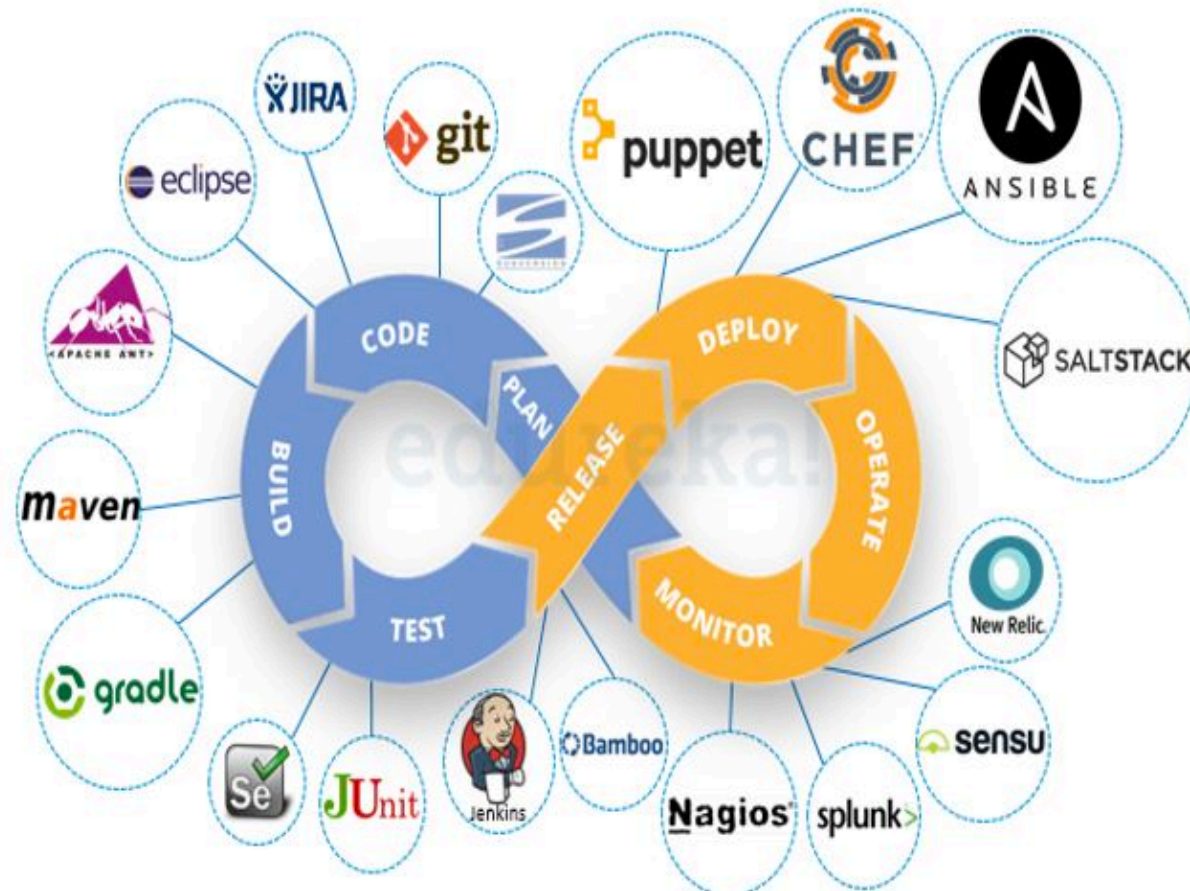


No!

But you have to learn new capabilities:

- **Application (Design and Development)**
- **Architecture**
- **Infrastructure (Network, Security and IaC)**

SOME TOOLS FOR INFRASTRUCTURE AUTOMATION **INFRASTRUCTURE AS CODE**



- OCI CLI
- Terraform
- Ansible

ORACLE DATABASE CLOUD

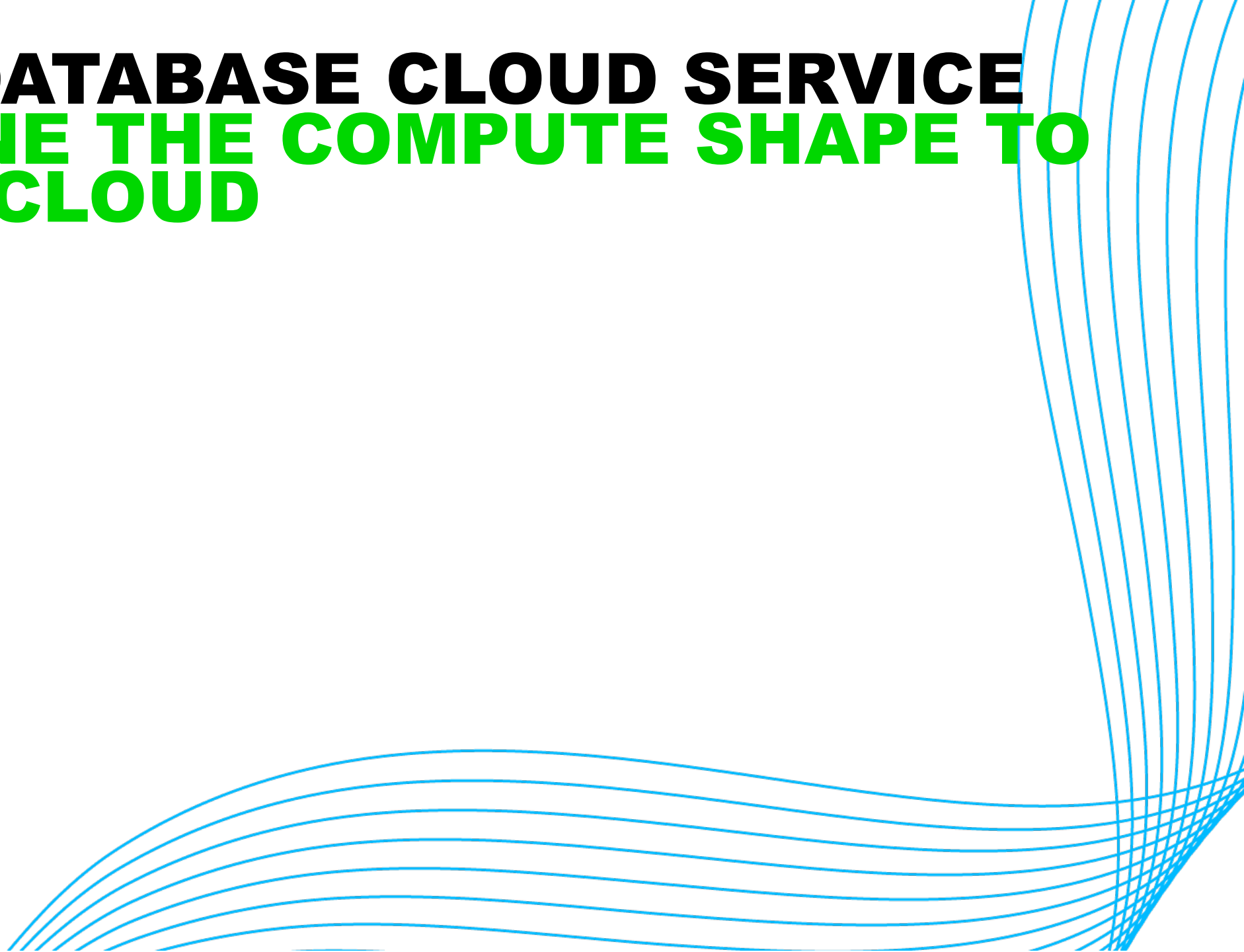
- Oracle Database Cloud Service - Virtual Machines / Bare Metal
- Oracle Database Exadata Cloud Service
- Oracle Database Exadata Cloud at Customer
- Autonomous Transaction Processing
- Autonomous Data Warehouse

- Oracle Database Exadata Express Cloud Service – Managed
- Oracle Database Schema Cloud Service - Managed

<https://cloud.oracle.com/database>



ORACLE DATABASE CLOUD SERVICE **DETERMINE THE COMPUTE SHAPE TO** **MOVE TO CLOUD**



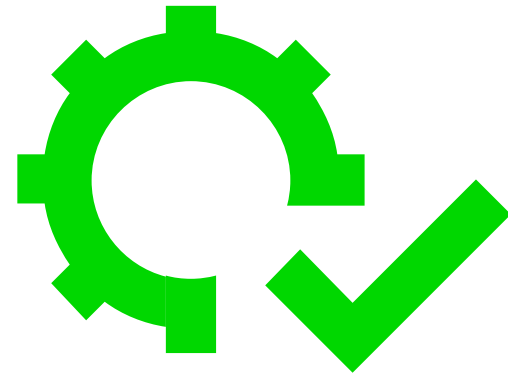
ORACLE DATABASE CLOUD SERVICE DETERMINE COMPUTE SHAPE

I'm THE DBA



ORACLE DATABASE CLOUD SERVICE DETERMINE COMPUTE SHAPE

I will use the same amount of CPUs
and memory that I have on-premises!



ORACLE DATABASE CLOUD SERVICE

DETERMINE COMPUTE SHAPE



ORACLE DATABASE CLOUD SERVICE DETERMINE COMPUTE SHAPE

Use Database Consolidation Workbench



The screenshot shows the Oracle Enterprise Manager Cloud Control 13c interface. At the top, it says "ORACLE Enterprise Manager Cloud Control 13c" and "SYSMAN". Below this is a progress bar with five steps: Resources, Constraints, Destinations Planning (which is the active step), Destination Mapping, and Review. The main content area is titled "Create Scenario for Project : Destinations Planning". It shows "Sources 1", "Minimum Required CPU (SPEC Metric) 13", and "Minimum Required Memory (GB) 3". Under "Destination Candidates", there are three dropdown menus: "Database Architecture" set to "Singleton Database (non-CDB)", "Database Clustered" set to "No", and "Server" set to "Oracle Compute Cloud". Below these are two radio buttons: "Use New (Phantom) Database on New (phantom) Servers" (which is selected) and "Use Existing Databases". A search box contains the text "Configuration OC3". At the bottom, it says "Shared Storage Configuration".

**Database Consolidation Workbench requires the Database Diagnostics pack license.

ORACLE DATABASE CLOUD SERVICE

DETERMINE COMPUTE SHAPE

Ok!

Now we have the definition of CPUs, Memory and Storage equivalent in the Oracle Cloud.

ORACLE DATABASE CLOUD SERVICE **CLOUD DATABASE**

In this presentation, I'm assuming you already have the Database created in the Oracle Cloud.

ORACLE DATABASE CLOUD SERVICE

CLOUD DATABASE

<https://www.oracle.com/goto/move>

Select your source



Select your target Oracle Database Cloud Service



ORACLE DATABASE CLOUD

SOME MIGRATION METHODS

Migration Methods

Many methods exist to migrate Oracle databases to the Oracle Cloud Infrastructure Database service. Which of these methods apply to a given migration scenario depends on several factors, including the version, character set, and platform endian format of the source and target databases.

- Data Pump Conventional Export/Import
- Data Pump Full Transportable
- Data Pump Transportable Tablespace
- Remote Cloning a PDB
- Remote Cloning Non-CDB
- RMAN Cross-Platform Transportable PDB
- RMAN Cross-Platform Transportable Tablespace Backup Sets
- RMAN Transportable Tablespace with Data Pump
- RMAN DUPLICATE from an Active Database
- RMAN CONVERT Transportable Tablespace with Data Pump
- SQL Developer and INSERT Statements to Migrate Selected Objects
- SQL Developer and SQL*Loader to Migrate Selected Objects
- Unplugging/Plugging a PDB
- Unplugging/Plugging Non-CDB

<https://docs.cloud.oracle.com/iaas/Content/Database/Tasks/migrating.htm>

ORACLE DATABASE CLOUD

MIGRATING FROM NON-CDB TO CDB

- <https://mikedietrichde.com/2019/07/22/database-migration-from-non-cdb-to-pdb-overview/>
- <https://mikedietrichde.com/2019/07/23/database-migration-from-non-cdb-to-pdb-upgrade-plug-in-convert/>
- <https://mikedietrichde.com/2019/07/24/database-migration-from-non-cdb-to-pdb-plug-in-upgrade-convert/>
- <https://mikedietrichde.com/2019/07/25/database-migration-from-non-cdb-to-pdb-clone-via-noncdb-upgrade-convert/>
- <https://mikedietrichde.com/2019/07/29/database-migration-from-non-cdb-to-pdb-typical-plugin-issues-and-workarounds/>
- <https://mikedietrichde.com/2019/07/29/database-migration-from-non-cdb-to-pdb-the-compatible-pitfall/>
- <https://mikedietrichde.com/2019/07/30/database-migration-from-non-cdb-to-pdb-the-time-zone-pitfall/>
- <https://mikedietrichde.com/2019/07/31/database-migration-from-non-cdb-to-pdb-the-component-pitfall/>
- <https://mikedietrichde.com/2019/08/01/database-migration-from-non-cdb-to-pdb-the-patch-level-pitfall/>
- <https://mikedietrichde.com/2019/08/02/database-migration-from-non-cdb-to-pdb-various-pitfalls/>
- <https://mikedietrichde.com/2019/08/05/database-migration-from-non-cdb-to-pdb-the-fallback-challenge/>
- <https://mikedietrichde.com/2019/08/13/database-migration-from-non-cdb-to-pdb-the-minimal-downtime-challenge/>
- <https://mikedietrichde.com/2019/08/14/database-migration-from-non-cdb-to-pdb-migration-with-data-pump/>

ORACLE DATABASE CLOUD

CHOOSING A MIGRATION METHOD

- On-premises Database Version → Cloud Database Version
- On-premises Host Operating System
- Database Size
- Network Bandwidth
- **Downtime**

<https://docs.oracle.com/en/cloud/paas/database-dbaas-cloud/csdbi/considerations-migrating-premises-database-dbcs.html>

ORACLE DATABASE CLOUD

MIGRATING FROM ORACLE DATABASE 11G TO ORACLE DATABASE 11G IN THE CLOUD

- Data Pump Conventional Export/Import
- Data Pump Transportable Tablespace
- RMAN Transportable Tablespace with Data Pump
- RMAN CONVERT Transportable Tablespace with Data Pump

ORACLE DATABASE CLOUD

MIGRATING FROM ORACLE DATABASE 11G TO ORACLE DATABASE 12C/18C/19C IN THE CLOUD

- Data Pump Conventional Export/Import
- Data Pump Transportable Tablespace
- RMAN Transportable Tablespace with Data Pump
- RMAN CONVERT Transportable Tablespace with Data Pump
- Data Pump Full Transportable

ORACLE DATABASE CLOUD

MIGRATING FROM ORACLE DATABASE

12C/18C/19C CDB TO ORACLE DATABASE

12C/18C/19C IN THE CLOUD

- Data Pump Conventional Export/Import
- Data Pump Transportable Tablespace
- RMAN Transportable Tablespace with Data Pump
- RMAN CONVERT Transportable Tablespace with Data Pump
- RMAN Cross-Platform Transportable Tablespace Backup Sets
- Data Pump Full Transportable
- Unplugging/Plugging (CDB)
- Remote Cloning (CDB)
- RMAN Cross-Platform Transportable PDB
- SQL Developer and SQL*Loader to Migrate Selected Objects
- SQL Developer and INSERT Statements to Migrate Selected Objects

ORACLE DATABASE CLOUD

MIGRATING FROM ORACLE DATABASE

12C/18C/19C NON-CDB TO ORACLE DATABASE

12C/18C/19C IN THE CLOUD

- Data Pump Conventional Export/Import
- Data Pump Transportable Tablespace
- RMAN Transportable Tablespace with Data Pump
- RMAN CONVERT Transportable Tablespace with Data Pump
- RMAN Cross-Platform Transportable Tablespace Backup Sets
- Data Pump Full Transportable
- Unplugging/Plugging (CDB)
- Remote Cloning (non-CDB)
- SQL Developer and SQL*Loader to Migrate Selected Objects
- SQL Developer and INSERT Statements to Migrate Selected Objects

ORACLE DATABASE CLOUD **CHOOSING A MIGRATION METHOD**

Downtime?

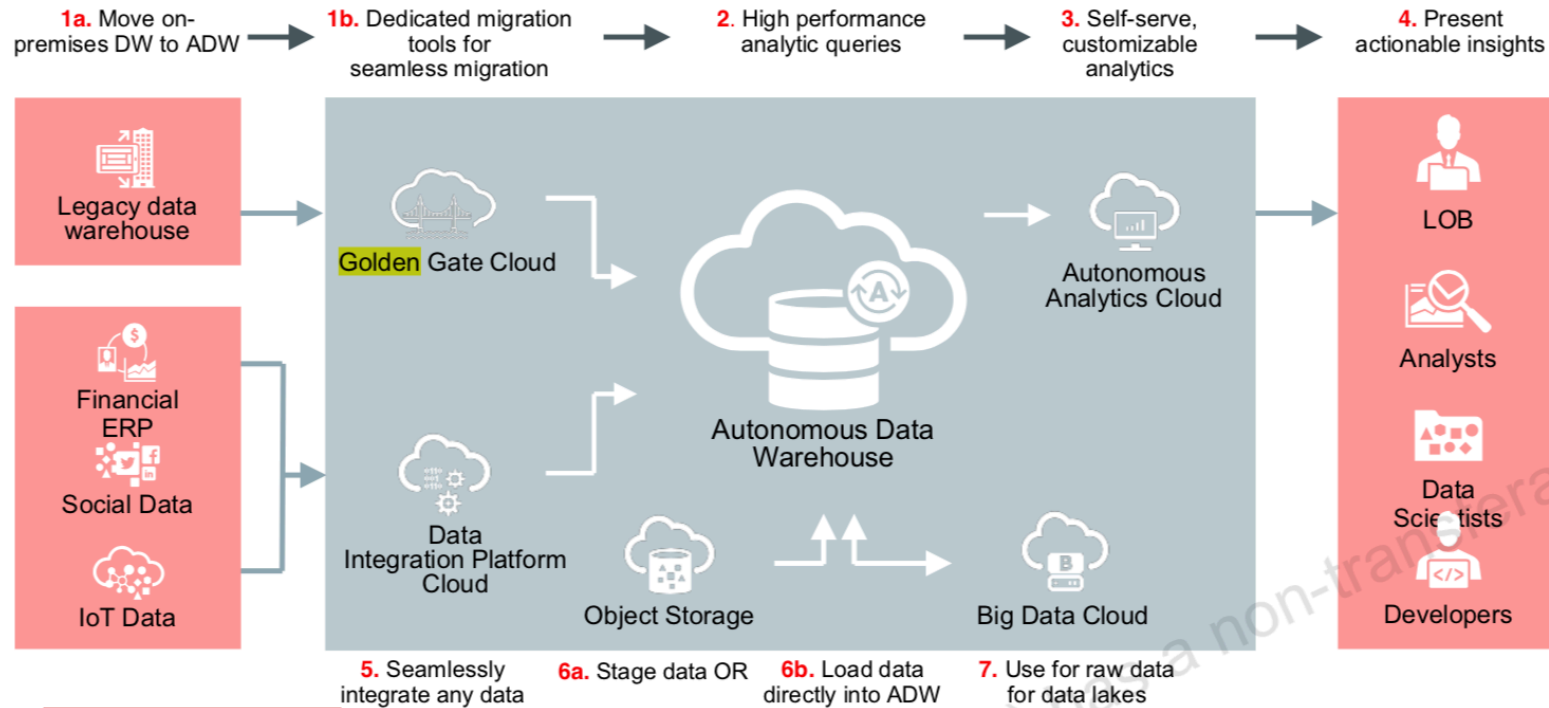
LOAD DATA

Uploading data to the cloud, even using fast public internet connections, migrating **100 TB** of data can take up to **8 months**.



LOAD DATA AUTONOMOUS DATABASE

Moving Existing Data Marts or DWs to the Cloud



- SQLDeveloper
- Data Pump
- Golden Gate

- ~~RMAN~~
- ~~Unplug/Plug~~
- ~~TTS~~

ORACLE

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LOAD DATA

DATA TRANSFER SERVICE

- Fast Data Migration → Move 100s of TB of data to Oracle Cloud Infrastructure in days, instead of weeks or months.
- Simple → Use the UI or the Data Transfer Utility to initiate the data migration process, **copy data to hard drives**, and **ship them to Oracle**, where we **import it**.
- Scalable → Whether you want to migrate a few **terabytes** or a **petabyte**, Data Transfer Service can help.
- Affordable → There is no cost to transfer data with Data Transfer Service.

<https://cloud.oracle.com/storage/data-transfer/features>

LOAD DATA DATA TRANSFER APPLIANCE







<https://blogs.oracle.com/cloud-infrastructure/introducing-oracle-cloud-infrastructure-data-transfer-appliance>

LOAD DATA / MIGRATION – BACKUP / RESTORE

ORACLE DATABASE CLOUD BACKUP MODULE

www.oracle.com/technetwork/database/availability/oracle-cloud-backup-2162729.html

ORACLE  Menu   Account  Coun

Oracle Technology Network / Database / High Availability


- Database Downloads
- Database In-Memory
- Multitenant
- More Key Features
- Application Development
- Big Data Appliance
- Cloud Database Services
- Private Database Cloud
- Data Warehousing & Big Data
- Database Appliance
- Exadata Database Machine
- High Availability
- Manageability
- Migrations
- Security

Oracle Database Cloud Backup Module

Thank you for accepting the OTN License Agreement; you may now download this software.

Oracle Database Cloud Backup Module is to be used only to back up to the [Oracle Database Backup Cloud Service](#) or the trial subscription of Oracle Storage Cloud Service.

Supported Oracle Database Versions (EE,SE,SE1,SE2): 10gR2 and above. (Refer to the [documentation](#) for more details)
Supported Platforms (64-bit) : Linux, Solaris, SPARC, Windows, HP-UX, AIX, zLinux

 **All Supported Platforms** (2,676,404 bytes) Note: Requires **JDK version 1.7** or higher).

For installation instructions and patch requirements, see the Oracle Database Backup Cloud Service [documentation](#). See the [white paper](#) for more details about the service. For FAQ, refer to the MOS Note [1640149.1](#).

LOAD DATA / MIGRATION – BACKUP / RESTORE

ORACLE DATABASE CLOUD BACKUP MODULE

- Download the Oracle Database Cloud Backup Module, and upload it to the source and target database instances.
- Log in as the **oracle** user, go to the directory, unzip **opc_installer.zip**, and run **java -jar oci_install.jar** to install the backup module.

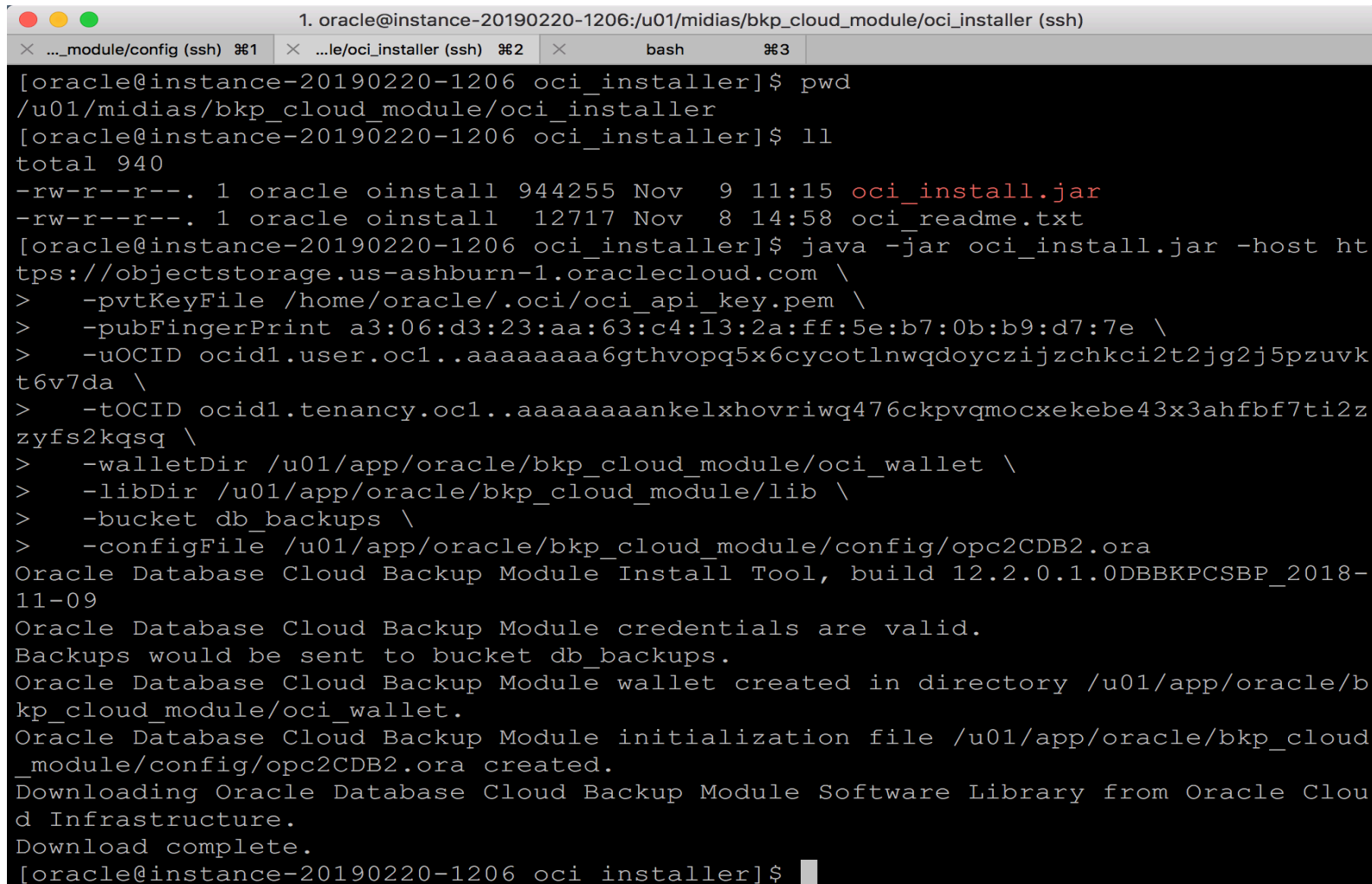
<https://www.oracle.com/technetwork/pt/articles/cloudcomp/migra%C3%A7ao-dbs-a-oci-p1-5462577-ptb.html>

LOAD DATA / MIGRATION – BACKUP / RESTORE **ORACLE DATABASE CLOUD BACKUP MODULE**

Database Server in the Oracle Cloud

LOAD DATA / MIGRATION – BACKUP / RESTORE

```
java -jar oci_install.jar -host https://objectstorage.us-phoenix-1.oraclecloud.com
-pvtKeyFile oci_private_key -pubFingerPrint oci_public_fingerprint -uOCID user_ocid -tOCID tenancy_ocid
-walletDir /wallet_directory -libDir /library_directory
```



```
1. oracle@instance-20190220-1206:/u01/midias/bkp_cloud_module/oci_installer (ssh)
..._module/config (ssh) 1 x ...le/oci_installer (ssh) 2 x bash 3 x
[oracle@instance-20190220-1206 oci_installer]$ pwd
/u01/midias/bkp_cloud_module/oci_installer
[oracle@instance-20190220-1206 oci_installer]$ ll
total 940
-rw-r--r--. 1 oracle oinstall 944255 Nov  9 11:15 oci_install.jar
-rw-r--r--. 1 oracle oinstall 12717 Nov  8 14:58 oci_readme.txt
[oracle@instance-20190220-1206 oci_installer]$ java -jar oci_install.jar -host ht
tps://objectstorage.us-ashburn-1.oraclecloud.com \
> -pvtKeyFile /home/oracle/.oci/oci_api_key.pem \
> -pubFingerPrint a3:06:d3:23:aa:63:c4:13:2a:ff:5e:b7:0b:b9:d7:7e \
> -uOCID ocid1.user.oc1..aaaaaaaaa6gthvopq5x6cycotlnwqdoyczijzchkci2t2jg2j5pzuvk
t6v7da \
> -tOCID ocid1.tenancy.oc1..aaaaaaaankelxhovriwq476ckpvqmocxekebe43x3ahfbf7ti2z
zyfs2kqsq \
> -walletDir /u01/app/oracle/bkp_cloud_module/oci_wallet \
> -libDir /u01/app/oracle/bkp_cloud_module/lib \
> -bucket db_backups \
> -configFile /u01/app/oracle/bkp_cloud_module/config/opc2CDB2.ora
Oracle Database Cloud Backup Module Install Tool, build 12.2.0.1.0DBBKPCSBP_2018-
11-09
Oracle Database Cloud Backup Module credentials are valid.
Backups would be sent to bucket db_backups.
Oracle Database Cloud Backup Module wallet created in directory /u01/app/oracle/b
kp_cloud_module/oci_wallet.
Oracle Database Cloud Backup Module initialization file /u01/app/oracle/bkp_cloud
_module/config/opc2CDB2.ora created.
Downloading Oracle Database Cloud Backup Module Software Library from Oracle Clou
d Infrastructure.
Download complete.
[oracle@instance-20190220-1206 oci_installer]$
```

LOAD DATA / MIGRATION – BACKUP / RESTORE

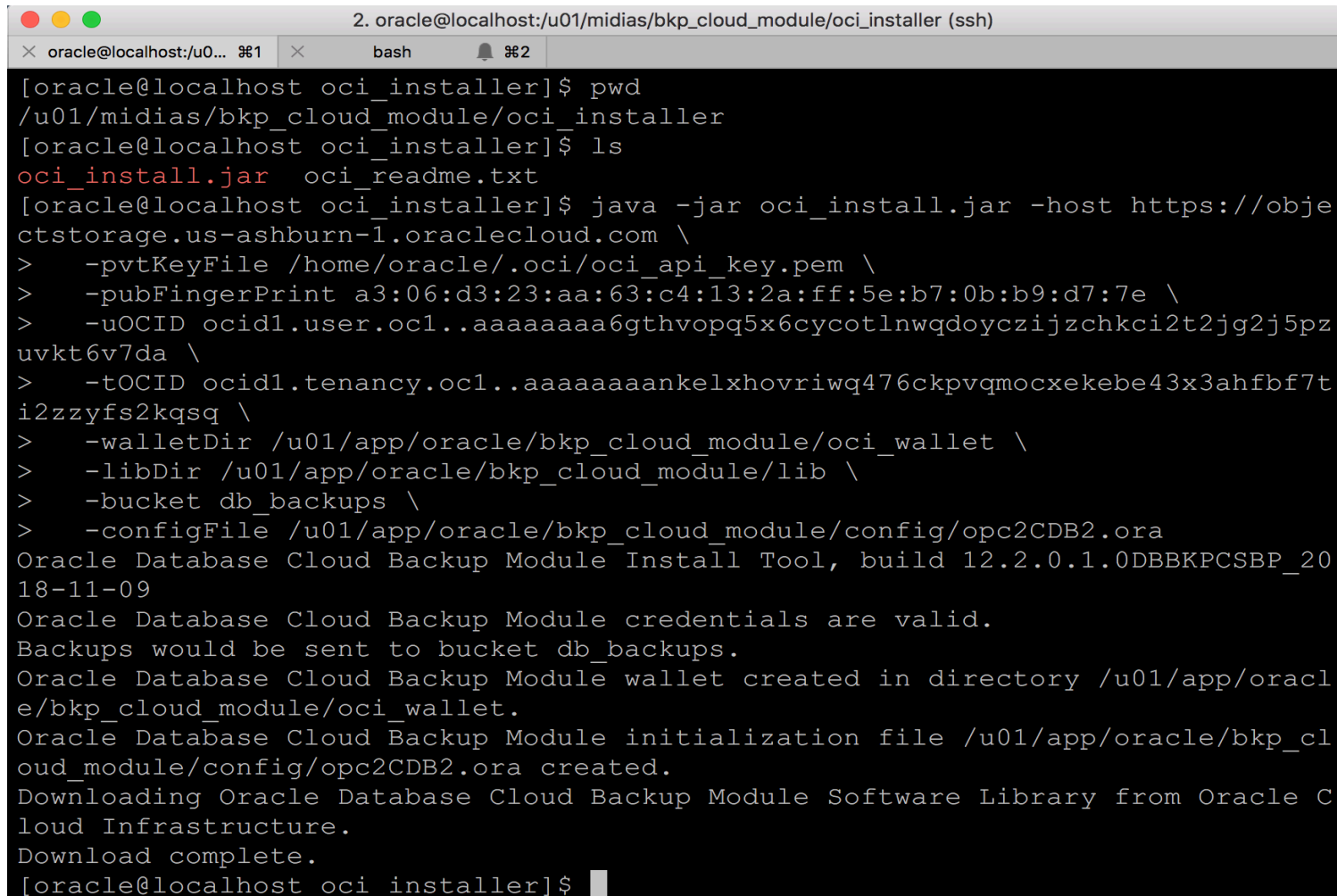
```
1. oracle@instance-20190220-1206:/u01/app/oracle/bkp_cloud_module/config (ssh)
X ..._module/config (ssh) №1 X ...le/oci_installer (ssh) №2 X bash №3
[oracle@instance-20190220-1206 config]$ pwd
/u01/app/oracle/bkp_cloud_module/config
[oracle@instance-20190220-1206 config]$ ll
total 4
-rw-r--r--. 1 oracle oinstall 324 Feb 20 19:12 opc2CDB2.ora
[oracle@instance-20190220-1206 config]$ cat opc2CDB2.ora
OPC_HOST=https://objectstorage.us-ashburn-1.oraclecloud.com/n/alexzaballa2019
OPC_WALLET='LOCATION=file:/u01/app/oracle/bkp_cloud_module/oci_wallet CREDENTIAL_
ALIAS=alias_oci'
OPC_CONTAINER=db_backups
OPC_COMPARTMENT_ID=ocid1.compartment.oc1..aaaaaaaa7yrgh5lm6cy33mbde3jzh13clfm3snt
4sj44geok3faxgwuapmvq
OPC_AUTH_SCHEME=BMC
[oracle@instance-20190220-1206 config]$ █
```

LOAD DATA / MIGRATION – BACKUP / RESTORE **ORACLE DATABASE CLOUD BACKUP MODULE**

Database Server on-premises

LOAD DATA / MIGRATION – BACKUP / RESTORE

```
java -jar oci_install.jar -host https://objectstorage.us-phoenix-1.oraclecloud.com
-pvtKeyFile oci_private_key -pubFingerPrint oci_public_fingerprint -uOCID user_ocid -tOCID tenancy_ocid
-walletDir /wallet_directory -libDir /library_directory
```



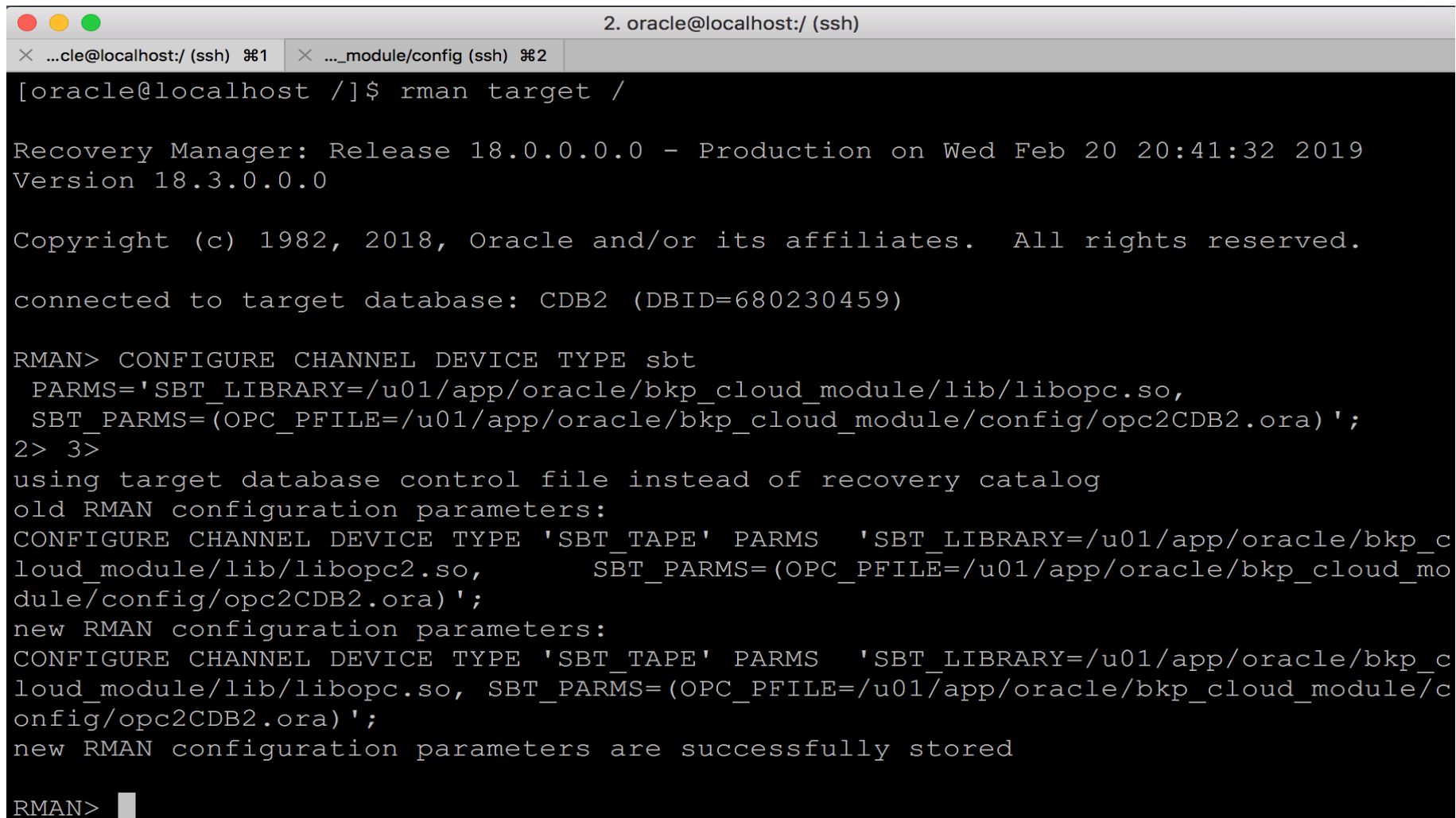
```
2. oracle@localhost:/u01/midias/bkp_cloud_module/oci_installer (ssh)
[oracle@localhost oci_installer]$ pwd
/u01/midias/bkp_cloud_module/oci_installer
[oracle@localhost oci_installer]$ ls
oci_install.jar  oci_readme.txt
[oracle@localhost oci_installer]$ java -jar oci_install.jar -host https://objectstorage.us-ashburn-1.oraclecloud.com \
> -pvtKeyFile /home/oracle/.oci/oci_api_key.pem \
> -pubFingerPrint a3:06:d3:23:aa:63:c4:13:2a:ff:5e:b7:0b:b9:d7:7e \
> -uOCID ocid1.user.oc1..aaaaaaa6gthvopq5x6cycotlnwqdoyczijzchkci2t2jg2j5pzuvkt6v7da \
> -tOCID ocid1.tenancy.oc1..aaaaaaaankelxhovriwq476ckpvqmocxekebe43x3ahfbf7ti2zzyfs2kqsq \
> -walletDir /u01/app/oracle/bkp_cloud_module/oci_wallet \
> -libDir /u01/app/oracle/bkp_cloud_module/lib \
> -bucket db_backups \
> -configFile /u01/app/oracle/bkp_cloud_module/config/opc2CDB2.ora
Oracle Database Cloud Backup Module Install Tool, build 12.2.0.1.0DBBKPCSBP_2018-11-09
Oracle Database Cloud Backup Module credentials are valid.
Backups would be sent to bucket db_backups.
Oracle Database Cloud Backup Module wallet created in directory /u01/app/oracle/bkp_cloud_module/oci_wallet.
Oracle Database Cloud Backup Module initialization file /u01/app/oracle/bkp_cloud_module/config/opc2CDB2.ora created.
Downloading Oracle Database Cloud Backup Module Software Library from Oracle Cloud Infrastructure.
Download complete.
[oracle@localhost oci_installer]$
```

LOAD DATA / MIGRATION – BACKUP / RESTORE

```
2. oracle@localhost:/u01/app/oracle/bkp_cloud_module/config (ssh)
X oracle@localhost:/u0... #1 X bash #2
[oracle@localhost bkp_cloud_module]$ ls
config lib oci_wallet
[oracle@localhost bkp_cloud_module]$ cd config/
[oracle@localhost config]$ ls
opc2CDB2.ora
[oracle@localhost config]$ cat opc2CDB2.ora
OPC_HOST=https://objectstorage.us-ashburn-1.oraclecloud.com/n/alexzaballa2019
OPC_WALLET='LOCATION=file:/u01/app/oracle/bkp_cloud_module/oci_wallet CREDENTI
AL_ALIAS=alias_oci'
OPC_CONTAINER=db_backups
OPC_COMPARTMENT_ID=ocid1.compartment.oc1..aaaaaaaa7yrgh5lm6cy33mbde3jzh13clfm3
snt4sj44geok3faxgwuapmvq
OPC_AUTH_SCHEME=BMC
[oracle@localhost config]$
```

LOAD DATA / MIGRATION – BACKUP / RESTORE

```
CONFIGURE CHANNEL DEVICE TYPE sbt  
PARMS='SBT_LIBRARY=location-of-the-SBT-library-OCI-Backup-Module-for-OCI,  
SBT_PARMS=(OPC_PFILE=location-of-the-configuration file)';
```



```
2. oracle@localhost:/ (ssh)  
[oracle@localhost ~]$ rman target /  
  
Recovery Manager: Release 18.0.0.0.0 - Production on Wed Feb 20 20:41:32 2019  
Version 18.3.0.0.0  
  
Copyright (c) 1982, 2018, Oracle and/or its affiliates. All rights reserved.  
  
connected to target database: CDB2 (DBID=680230459)  
  
RMAN> CONFIGURE CHANNEL DEVICE TYPE sbt  
  PARMS='SBT_LIBRARY=/u01/app/oracle/bkp_cloud_module/lib/libopc.so,  
  SBT_PARMS=(OPC_PFILE=/u01/app/oracle/bkp_cloud_module/config/opc2CDB2.ora)';  
2> 3>  
using target database control file instead of recovery catalog  
old RMAN configuration parameters:  
CONFIGURE CHANNEL DEVICE TYPE 'SBT_TAPE' PARMS 'SBT_LIBRARY=/u01/app/oracle/bkp_c  
loud_module/lib/libopc2.so, SBT_PARMS=(OPC_PFILE=/u01/app/oracle/bkp_cloud_mo  
dule/config/opc2CDB2.ora)';  
new RMAN configuration parameters:  
CONFIGURE CHANNEL DEVICE TYPE 'SBT_TAPE' PARMS 'SBT_LIBRARY=/u01/app/oracle/bkp_c  
loud_module/lib/libopc.so, SBT_PARMS=(OPC_PFILE=/u01/app/oracle/bkp_cloud_modu  
le/config/opc2CDB2.ora)';  
new RMAN configuration parameters are successfully stored  
  
RMAN> █
```


LOAD DATA / MIGRATION – BACKUP / RESTORE

ORACLE DATABASE CLOUD BACKUP MODULE

```
2. oracle@localhost:/ (ssh)
x ...cle@localhost:/ (ssh) #1 x ..._module/config (ssh) #2
[oracle@localhost ~]$ rman target /

Recovery Manager: Release 18.0.0.0.0 - Production on Wed Feb 20 20:45:35 2019
Version 18.3.0.0.0

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connected to target database: CDB2 (DBID=680230459)

RMAN> SET ENCRYPTION ON IDENTIFIED BY 'my_strong_passwd' ONLY;

executing command: SET encryption
using target database control file instead of recovery catalog

RMAN> BACKUP DEVICE TYPE sbt DATABASE;

Starting backup at 20-FEB-19
allocated channel: ORA_SBT_TAPE_1
channel ORA_SBT_TAPE_1: SID=38 device type=SBT_TAPE
channel ORA_SBT_TAPE_1: Oracle Database Backup Service Library VER=12.2.0.2
channel ORA_SBT_TAPE_1: starting compressed full datafile backup set
channel ORA_SBT_TAPE_1: specifying datafile(s) in backup set
input datafile file number=00001 name=/u02/oradata/CDB2/system01.dbf
input datafile file number=00003 name=/u02/oradata/CDB2/sysaux01.dbf
input datafile file number=00005 name=/u02/oradata/CDB2/undotbs01.dbf
input datafile file number=00007 name=/u02/oradata/CDB2/users01.dbf
channel ORA_SBT_TAPE_1: starting piece 1 at 20-FEB-19
channel ORA_SBT_TAPE_1: finished piece 1 at 20-FEB-19
piece handle=35tqco7o_1_1 tag=TAG20190220T204544 comment=API Version 2.0,MMS Versi
on 12.2.0.2
channel ORA_SBT_TAPE_1: backup set complete, elapsed time: 00:03:45
channel ORA_SBT_TAPE_1: starting compressed full datafile backup set
channel ORA_SBT_TAPE_1: specifying datafile(s) in backup set
input datafile file number=00009 name=/u02/oradata/CDB2/82596C33CD6732BBE05500000
000001/datafile/o1 mf sysaux g6vbw01s .dbf
```

SET ENCRYPTION ON IDENTIFIED BY 'my_passwd';

BACKUP DEVICE TYPE SBT DATABASE;

backup as compressed backupset DEVICE TYPE sbt incremental
level 0 database plus archivelog;

backup as compressed backupset DEVICE TYPE sbt incremental
level 1 database plus archivelog;

LOAD DATA / MIGRATION – BACKUP / RESTORE **ORACLE DATABASE CLOUD BACKUP MODULE**

Database Server in the Oracle Cloud

LOAD DATA / MIGRATION – BACKUP / RESTORE

ORACLE DATABASE CLOUD BACKUP MODULE

```
1. oracle@instance-20190220-1206:~ (ssh)
x oracle@instance-201... #1 x bash #2 x oracle@instance-... #3

Recovery Manager: Release 18.0.0.0.0 - Production on Wed Feb 20 20:11:47 2019
Version 18.3.0.0.0

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connected to target database (not started)

RMAN> STARTUP NOMOUNT;

startup failed: ORA-01078: failure in processing system parameters
LRM-00109: could not open parameter file '/u01/app/oracle/product/18.0.0/dbhome_1/
dbs/initCDB2.ora'

starting Oracle instance without parameter file for retrieval of spfile
Oracle instance started

Total System Global Area      1073740616 bytes

Fixed Size                    8665928 bytes
Variable Size                  281018368 bytes
Database Buffers               775946240 bytes
Redo Buffers                   8110080 bytes

RMAN> SET DECRYPTION IDENTIFIED BY 'my_strong_passwd';

executing command: SET decryption
using target database control file instead of recovery catalog

RMAN> SET DBID=680230459;

executing command: SET DBID

RMAN> █
```

STARTUP NOMOUNT;

SET DECRYPTION ON IDENTIFIED BY 'my_passwd';

SET DBID = your_source_db_id;

LOAD DATA / MIGRATION – BACKUP / RESTORE

ORACLE DATABASE CLOUD BACKUP MODULE

Restore the Server Parameter File:

```
1. oracle@instance-20190220-1206:~ (ssh)
x oracle@instance-201... #1 x bash #2 x oracle@instance-20... #3
RMAN> RUN {
ALLOCATE CHANNEL t1 DEVICE TYPE sbt
  PARS='SBT_LIBRARY=/u01/app/oracle/bkp_cloud_module/lib/libopc.so,
  SBT_PARAMS=(OPC_PFILE=/u01/app/oracle/bkp_cloud_module/config/opc2CDB2.ora)';

RESTORE SPFILE TO PFILE '/u01/app/oracle/product/18.0.0/dbhome_1/dbs/initCDB2.ora'
  FROM AUTOBACKUP;
}
2> 3> 4> 5> 6> 7>
allocated channel: t1
channel t1: SID=4 device type=SBT_TAPE
channel t1: Oracle Database Backup Service Library VER=12.2.0.2

Starting restore at 20-FEB-19

channel t1: looking for AUTOBACKUP on day: 20190220
channel t1: AUTOBACKUP found: c-680230459-20190220-00
channel t1: restoring spfile from AUTOBACKUP c-680230459-20190220-00
channel t1: SPFILE restore from AUTOBACKUP complete
Finished restore at 20-FEB-19
released channel: t1

RMAN>
```

**RESTORE SPFILE TO
PFILE '\$ORACLE_HOME/dbs/initCDB2.ora'
FROM AUTOBACKUP;**

LOAD DATA / MIGRATION – BACKUP / RESTORE

ORACLE DATABASE CLOUD BACKUP MODULE

Restore the Database Control Files:

```

RMAN> RUN {
ALLOCATE CHANNEL t1 DEVICE TYPE sbt
  PARS='SBT_LIBRARY=/u01/app/oracle/bkp_cloud_module/lib/libopc.so,
  SBT_PARAMS=(OPC_PFILE=/u01/app/oracle/bkp_cloud_module/config/opc2CDB2.ora)';

RESTORE CONTROLFILE FROM AUTOBACKUP;
}2> 3> 4> 5> 6> 7>

allocated channel: t1
channel t1: SID=20 device type=SBT_TAPE
channel t1: Oracle Database Backup Service Library VER=12.2.0.2

Starting restore at 20-FEB-19

channel t1: looking for AUTOBACKUP on day: 20190220
channel t1: AUTOBACKUP found: c-680230459-20190220-00
channel t1: restoring control file from AUTOBACKUP c-680230459-20190220-00
channel t1: control file restore from AUTOBACKUP complete
output file name=/u02/oradata/CDB2/control01.ctl
output file name=/u02/oradata/CDB2/control02.ctl
Finished restore at 20-FEB-19
released channel: t1

RMAN> ALTER DATABASE MOUNT;

Statement processed

RMAN>

```

**RESTORE CONTROLFILE FROM
AUTOBACKUP;**

ALTER DATABASE MOUNT;

LOAD DATA / MIGRATION – BACKUP / RESTORE

ORACLE DATABASE CLOUD BACKUP MODULE

Restore/Recover the Database Files:

```
RMAN> RESTORE DATABASE;

Starting restore at 20-FEB-19
Starting implicit crosscheck backup at 20-FEB-19
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=23 device type=DISK
Finished implicit crosscheck backup at 20-FEB-19

Starting implicit crosscheck copy at 20-FEB-19
using channel ORA_DISK_1
Finished implicit crosscheck copy at 20-FEB-19

searching for all files in the recovery area
cataloging files...
no files cataloged

allocated channel: ORA_SBT_TAPE_1
channel ORA_SBT_TAPE_1: SID=24 device type=SBT_TAPE
channel ORA_SBT_TAPE_1: Oracle Database Backup Service Library VER=12.2.0.2
using channel ORA_DISK_1

channel ORA_SBT_TAPE_1: starting datafile backup set restore
channel ORA_SBT_TAPE_1: specifying datafile(s) to restore from backup set
channel ORA_SBT_TAPE_1: restoring datafile 00001 to /u02/oradata/CDB2/system01.dbf
channel ORA_SBT_TAPE_1: restoring datafile 00003 to /u02/oradata/CDB2/sysaux01.dbf
channel ORA_SBT_TAPE_1: restoring datafile 00005 to /u02/oradata/CDB2/undotbs01.dbf
channel ORA_SBT_TAPE_1: restoring datafile 00007 to /u02/oradata/CDB2/users01.dbf
channel ORA_SBT_TAPE_1: reading from backup piece 35tqco7o 1 1
```

RESTORE DATABASE;

LOAD DATA / MIGRATION – BACKUP / RESTORE

ORACLE DATABASE CLOUD BACKUP MODULE

Restore/Recover the Database Files:

```
RMAN> RECOVER DATABASE UNTIL SCN 3325612;

Starting recover at 20-FEB-19
using channel ORA_SBT_TAPE_1
allocated channel: ORA_DISK_1
channel ORA_DISK_1: SID=24 device type=DISK

starting media recovery
media recovery complete, elapsed time: 00:00:00

Finished recover at 20-FEB-19

RMAN> |
```

RECOVER DATABASE options;

```
UNTIL SCN
UNTIL CANCEL
UNTIL AVAILABLE REDO
```

```
RMAN> ALTER DATABASE OPEN RESETLOGS;

Statement processed
```

ALTER DATABASE OPEN NORESETLOGS;

LOAD DATA / MIGRATION – BACKUP / RESTORE **ORACLE DATABASE CLOUD BACKUP MODULE**

- No upgrade to new version
- Source version 11.2.0.4, 12.1.0.2, 12.2.0.1, 18 e 19

MIGRATING AN ON-PREMISES DATABASE TO ORACLE CLOUD INFRASTRUCTURE

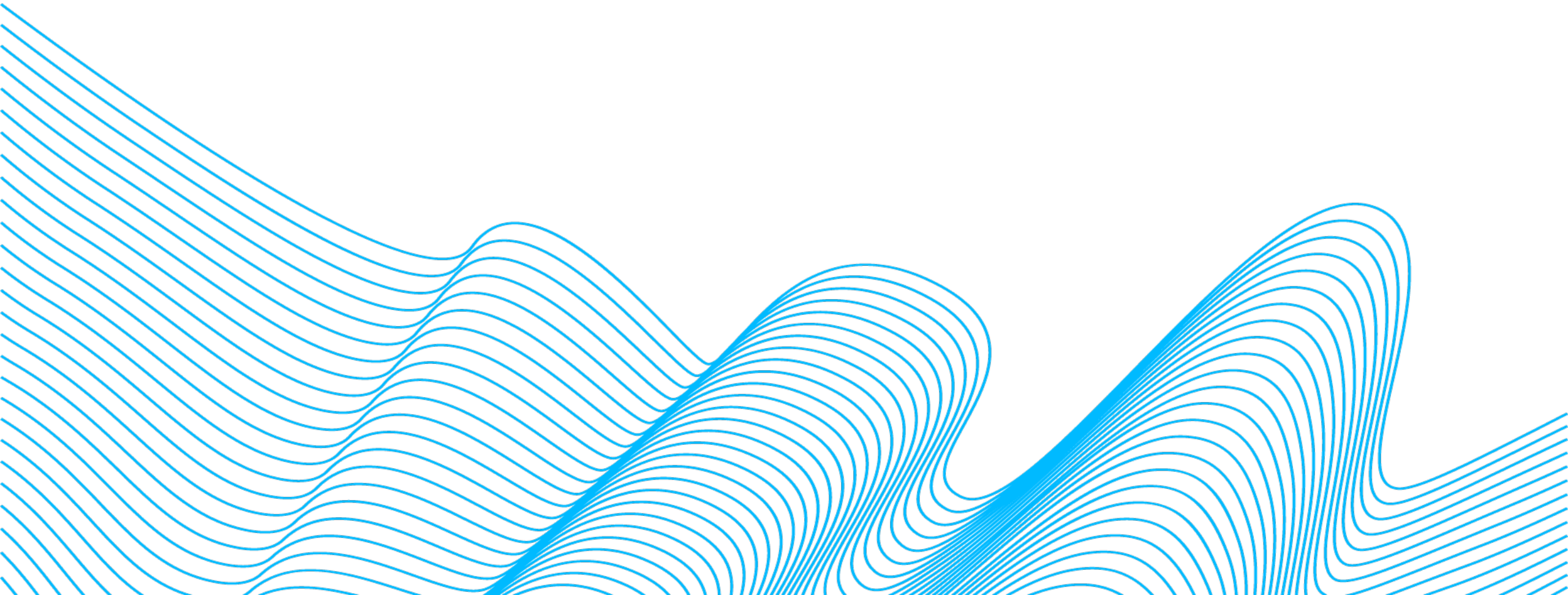
CREATE A BACKUP IN THE CLOUD

<https://blogs.oracle.com/dbcs/create-a-backup-in-the-cloud>

“In this blog, we are going to go over just that, a method to move your database into the Oracle's cloud with a single command.”

“We can use the Database Backup Cloud Service to take a full backup of a selected database then create a database in OCI from that backup.”

LOAD DATA / MIGRATION **USING DATA PUMP**



LOAD DATA / MIGRATION USING DATA PUMP

- Cross-endian possible
- Source version 10g and later
- Migrate from non-CDB to PDB
- Changes to database structure possible
- Upgrade to new version possible

ORACLE DATABASE CLOUD

DATA PUMP

On-premises host:

```
mkdir /u01/app/oracle/admin/orcl/dpdump/for_cloud
```

```
sqlplus user/password
```

```
CREATE DIRECTORY dp_for_cloud AS  
'/u01/app/oracle/admin/orcl/dpdump/for_cloud';
```

```
expdp user/password SCHEMAS=fsowner DIRECTORY=dp_for_cloud
```

ORACLE DATABASE CLOUD

DATA PUMP

Database Cloud Service compute node:

```
mkdir /u01/app/oracle/admin/ORCL/dpdump/from_onprem
```

On-premises host:

```
scp -i private_key_file \  
/u01/app/oracle/admin/orcl/dpdump/for_cloud/expdat.dmp\  
oracle@IP_address_DBaaS_VM:/u01/app/oracle/admin/ORCL/dpdump/from_onprem
```

Database Cloud Service compute node:

```
sqlplus user/password
```

```
CREATE DIRECTORY dp_from_onprem AS '/u01/app/oracle/admin/ORCL/dpdump/from_onprem';
```

```
impdp user/password SCHEMAS=fsowner DIRECTORY=dp_from_onprem
```

ORACLE DATABASE CLOUD

DATA PUMP

Options to consider:

- Database Link
- Object Storage

```
impdp admin/password@ADWC1_high \  
directory=data_pump_dir \  
credential=def_cred_name \  
dumpfile= https://swiftobjectstorage.us-phoenix-1.oraclecloud.com/v1/adwc/adwc\_user/export%u.dmp
```

<https://docs.oracle.com/en/cloud/paas/autonomous-data-warehouse-cloud/user/load-data.html#GUID-297FE3E6-A823-4F98-AD50-959ED96E6969>

LOAD DATA / MIGRATION **TRANSPORTABLE TABLESPACES**



LOAD DATA / MIGRATION USING TRANSPORTABLE TABLESPACES

- Cross-endian possible
- Source version 8i and later (sameOS) or 10g and later cross-endian
- Migrate from non-CDB to PDB
- Upgrade to new version possible

ORACLE DATABASE CLOUD TRANSPORTABLE TABLESPACE

On-premises host:

```
mkdir /u01/app/oracle/admin/orcl/dpdump/for_cloud
```

```
sqlplus user/password
```

```
CREATE DIRECTORY dp_for_cloud AS '/u01/app/oracle/admin/orcl/dpdump/for_cloud';
```

```
ALTER TABLESPACE fsindex READ ONLY;
```

```
ALTER TABLESPACE fsdata READ ONLY;
```

```
expdp user/password TRANSPORT_TABLESPACES=fsdata,fsindex  
TRANSPORT_FULL_CHECK=YES DIRECTORY=dp_for_cloud
```

ORACLE DATABASE CLOUD TRANSPORTABLE TABLESPACE

Database Cloud Service compute node:

```
mkdir /u01/app/oracle/admin/ORCL/dpdump/from_onprem
```

On-premises host:

```
$ scp -i private_key_file \ /u01/app/oracle/admin/orcl/dpdump/for_cloud/expdat.dmp \  
oracle@IP_address_DBaaS_VM:/u01/app/oracle/admin/ORCL/dpdump/from_onprem
```

```
$ scp -i private_key_file \ /u01/app/oracle/oradata/orcl/fsdata01.dbf \  
oracle@IP_address_DBaaS_VM:/u02/app/oracle/oradata/ORCL
```

```
$ scp -i private_key_file \ /u01/app/oracle/oradata/orcl/fsindex01.dbf \  
oracle@IP_address_DBaaS_VM:/u02/app/oracle/oradata/ORCL
```

```
ALTER TABLESPACE fsdata READ WRITE;  
ALTER TABLESPACE fsindex READ WRITE;
```

ORACLE DATABASE CLOUD TRANSPORTABLE TABLESPACE

Database Cloud Service compute node:

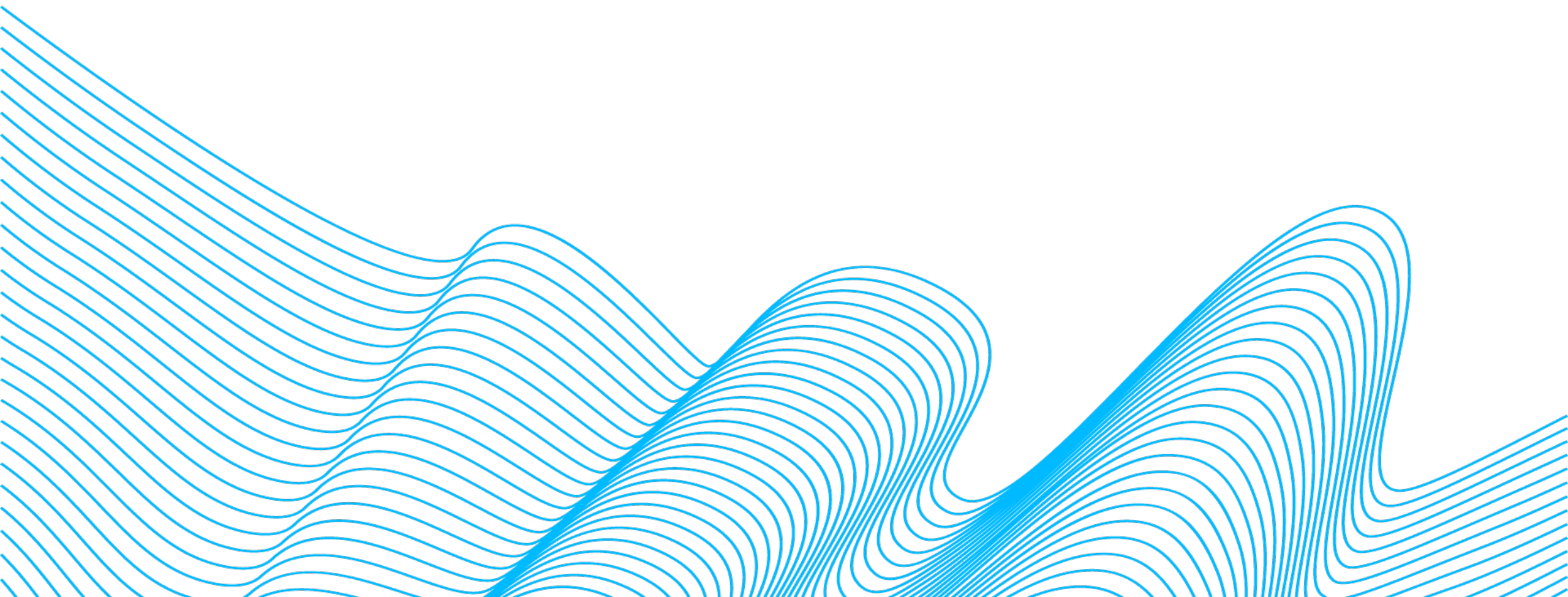
```
CREATE DIRECTORY dp_from_onprem AS '/u01/app/oracle/admin/ORCL/dpdump/from_onprem';
```

```
SQL> CREATE USER fsowner PROFILE default IDENTIFIED BY fspass TEMPORARY  
TABLESPACE temp ACCOUNT UNLOCK;
```

```
impdp user/password DIRECTORY=dp_from_onprem \  
TRANSPORT_DATAFILES='/u02/app/oracle/oradata/ORCL/fsdata01.dbf', \  
'/u02/app/oracle/oradata/ORCL/fsindex01.dbf'
```

```
ALTER TABLESPACE fsdata READ WRITE;  
ALTER TABLESPACE fsindex READ WRITE;
```

LOAD DATA / MIGRATION **USING DATA GUARD**



LOAD DATA / MIGRATION USING DATA GUARD

- No cross-endian
- No upgrade to new version
- **Minimal downtime migration**
- Source version 11.2.0.4, 12.1.0.2, 12.2.0.1, 18, 19

LOAD DATA / MIGRATION USING DATA GUARD

This migration can be done in two different ways:

- Using Oracle Database Cloud Services (DBaaS)
- Using Oracle Compute (IaaS).

ORACLE DATABASE CLOUD

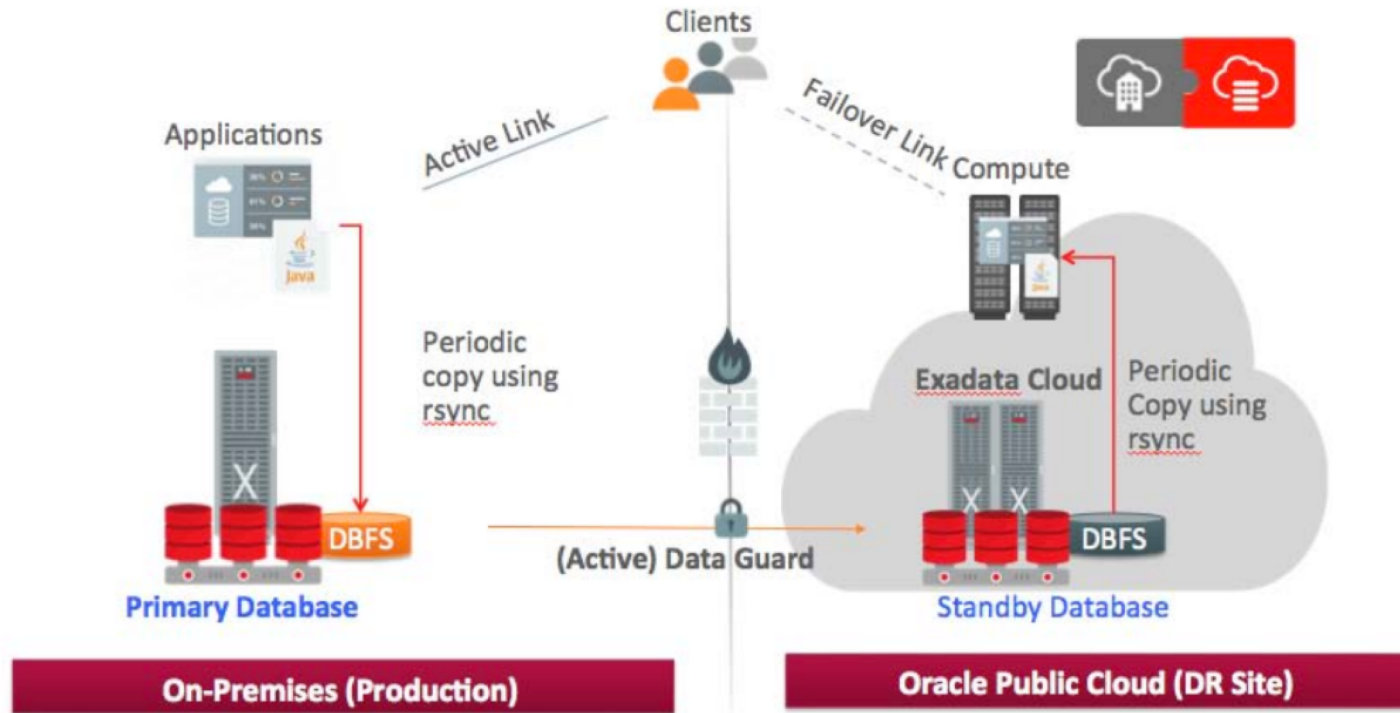
DATA GUARD

1. Create Physical Standby
2. Prepare Client Connections (Ex: tnsnames.ora)
3. Switchover to Physical Standby

Disaster Recovery to the Oracle Cloud

<http://www.oracle.com/technetwork/database/availability/dr-to-oracle-cloud-2615770.pdf>

ORACLE DATABASE CLOUD DATA GUARD



ORACLE DATABASE CLOUD

DATA GUARD

On-premises host:

```
SELECT log_mode FROM v$database;  
LOG_MODE
```

```
NOARCHIVELOG
```

```
SHUTDOWN IMMEDIATE;
```

```
STARTUP MOUNT;
```

```
ALTER DATABASE ARCHIVELOG;
```

```
ALTER DATABASE OPEN;
```

```
ALTER DATABASE FORCE LOGGING;
```

ORACLE DATABASE CLOUD

DATA GUARD

On-premises host:

- Create standby redo logs **on the primary database** initially (recommended).
- Create standby redo logs using the **same file size as the primary database** online redo logs.
- Create **one additional group** more than the number of online redo log groups.

```
ALTER DATABASE ADD STANDBY LOGFILE ('+REDO') SIZE XXM;  
ALTER DATABASE ADD STANDBY LOGFILE ('+REDO') SIZE XXM;  
ALTER DATABASE ADD STANDBY LOGFILE ('+REDO') SIZE XXM;  
ALTER DATABASE ADD STANDBY LOGFILE ('+REDO') SIZE XXM;
```

ORACLE DATABASE CLOUD DATA GUARD

Database Cloud Service compute node:

Init.ora:

```
*.db_name='cdb1'
```

```
mkdir -p /u01/app/oracle/admin/cdb1/adump
```

```
orapwd file=/u01/app/oracle/product/12.1.0.2/db_1/dbs/orapwcdb1 password=mypass entries=10
```

ORACLE DATABASE CLOUD

DATA GUARD

Database Cloud Service compute node:

```
export ORACLE_SID=cdb1 sqlplus / as sysdba
```

```
STARTUP NOMOUNT PFILE='/tmp/init.ora';
```

```
rman TARGET sys/password@cdb1 AUXILIARY sys/password@cdb1_stby
```

```
DUPLICATE TARGET DATABASE FOR STANDBY  
FROM ACTIVE DATABASE  
DORECOVER  
NOFILENAMECHECK;
```

ORACLE DATABASE CLOUD DATA GUARD

**Prepare Client Connections (Ex: tnsnames.ora) +
Firewall ports Database Cloud Service compute node:**

```
ALTER SYSTEM SET dg_broker_start=true;
```

```
dgmgrl sys/password@cdb1
```

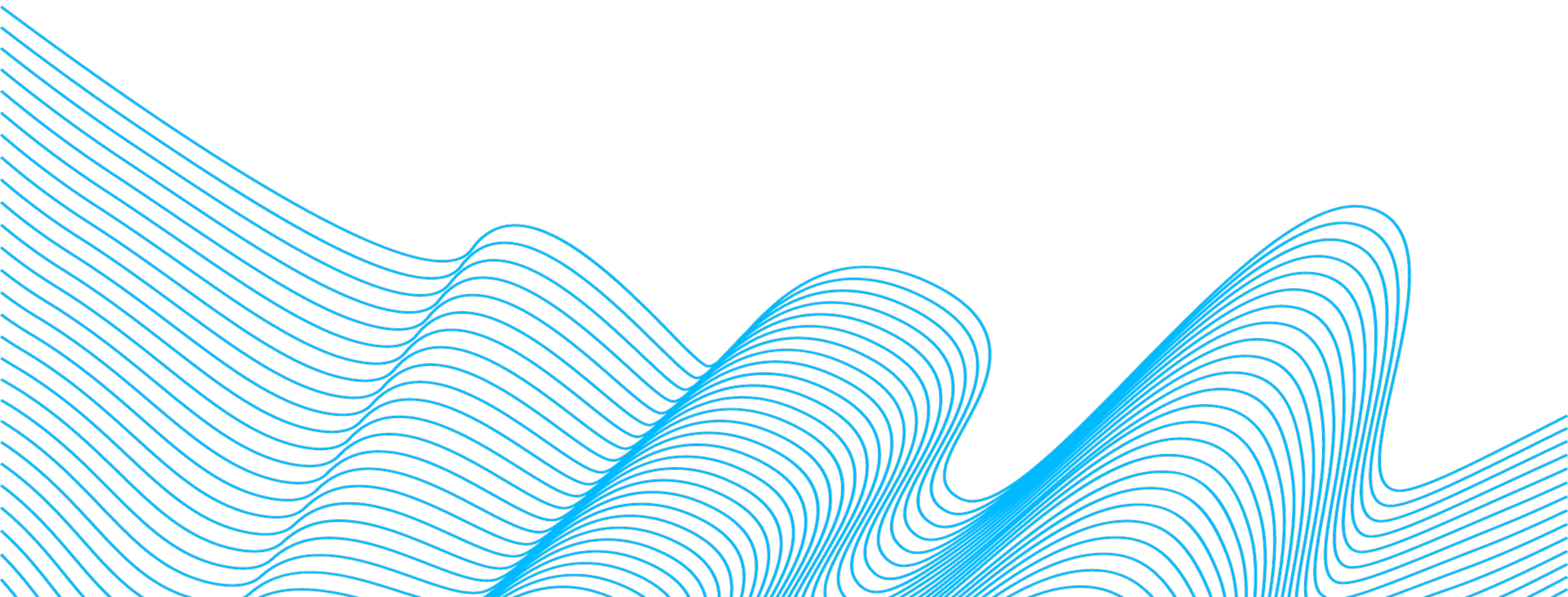
```
CREATE CONFIGURATION my_config AS PRIMARY DATABASE IS cdb1 CONNECT IDENTIFIER IS cdb1;
```

```
ADD DATABASE cdb1_stby AS CONNECT IDENTIFIER IS cdb1_stby MAINTAINED AS PHYSICAL;
```

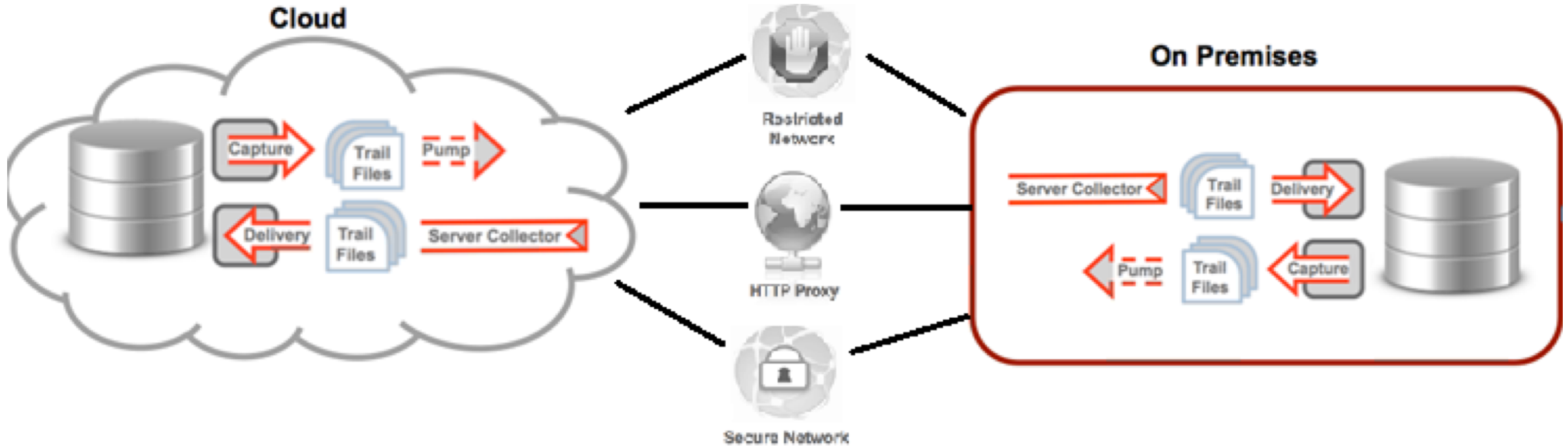
```
ENABLE CONFIGURATION;
```

```
SWITCHOVER TO cdb1_stby;
```

LOAD DATA / MIGRATION **GOLDENGATE CLOUD SERVICE**



ORACLE DATABASE CLOUD GOLDENGATE AND GOLDENGATE CLOUD SERVICE



LOAD DATA / MIGRATION USING GOLDENGATE CLOUD SERVICE

- Cross-endian possible
- Source version 8i and later
- Migrate from non-CDB to PDB
- Changes to database structure possible
- **Minimal downtime migration**
- **Upgrade to new version possible**

LOAD DATA / MIGRATION – BACKUP / RESTORE

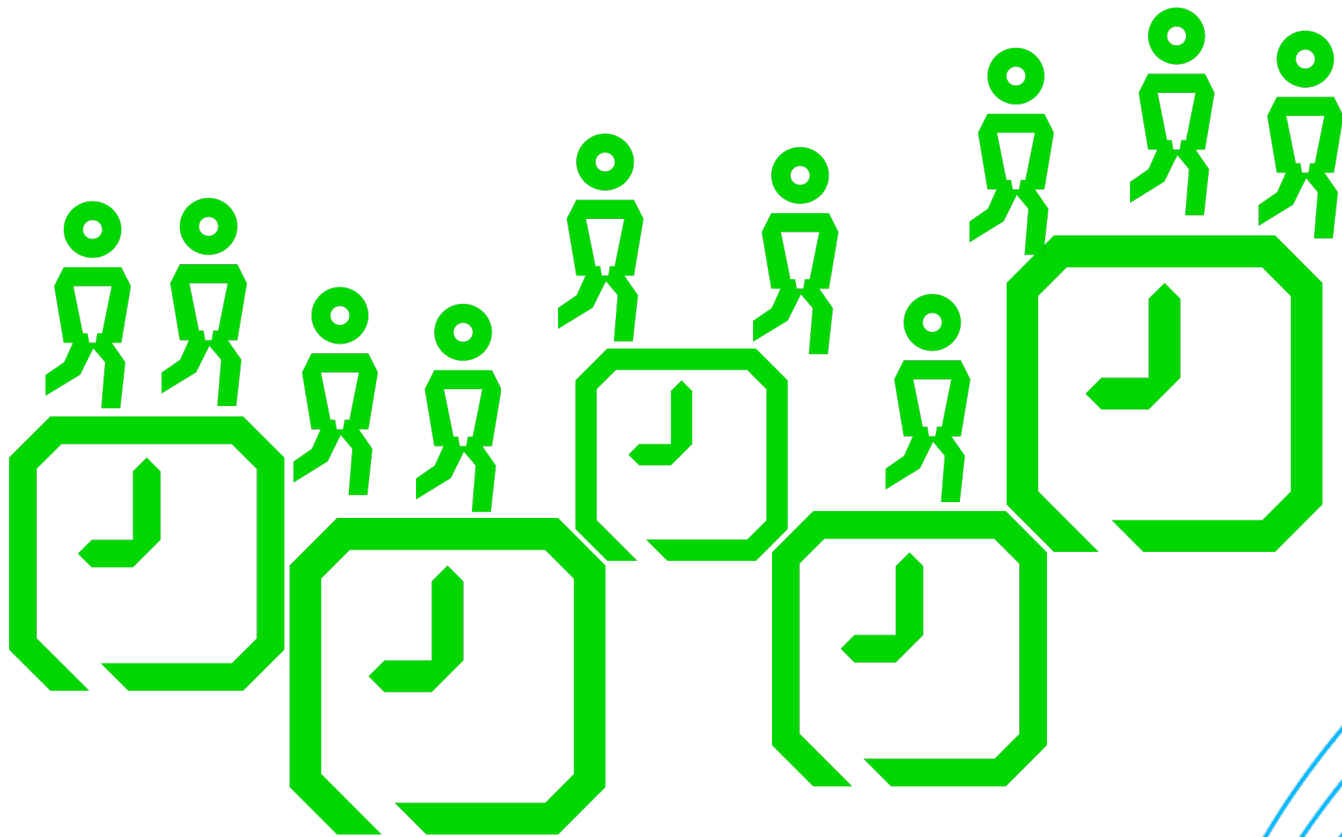
ORACLE DATABASE CLOUD BACKUP MODULE

8a. Migration Options

Other options:

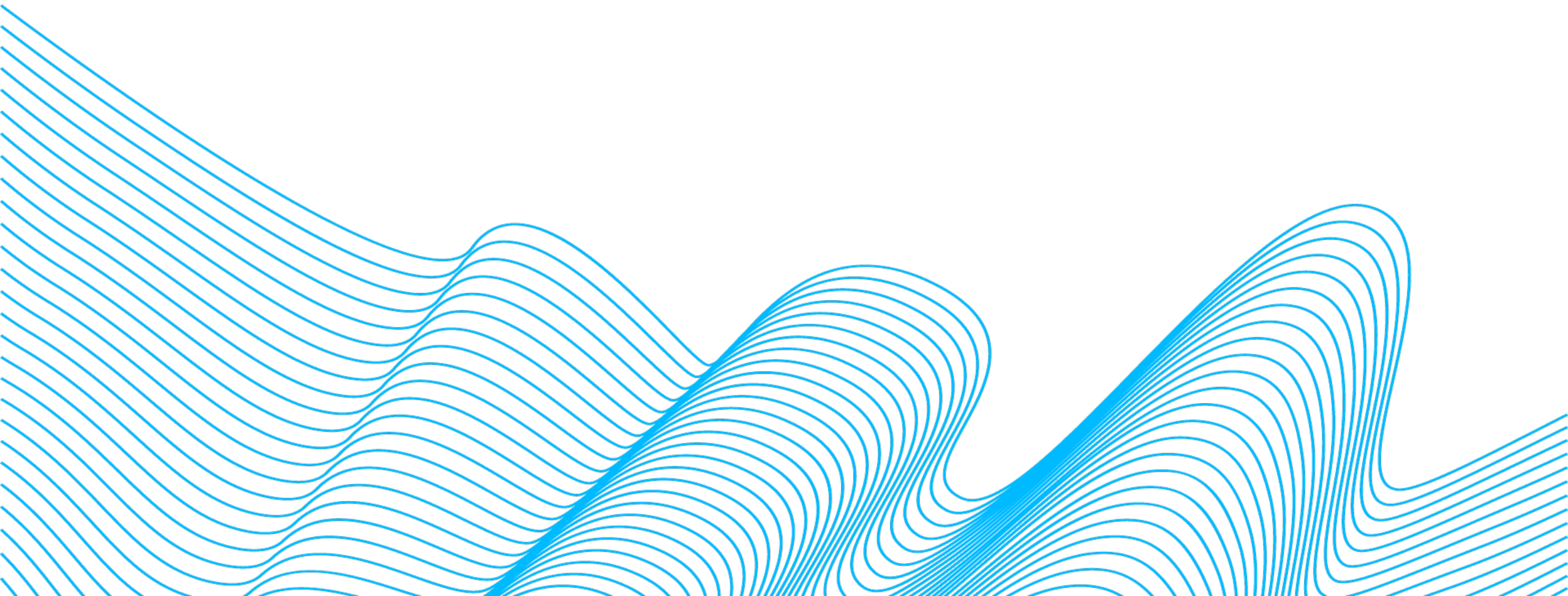
Live on MIG360

- 295. Data Pump Conventional Export/Import [text](#) (57)
- 296. Data Pump Conventional Export/Import - NON-CDB to CDB [text](#) (68)
- 297. Data Pump Transportable Tablespace [text](#) (95)
- 298. Data Pump Transportable Tablespace - NON-CDB to CDB [text](#) (108)
- 299. Data Pump Full Transportable [text](#) (95)
- 300. Data Pump Full Transportable - NON-CDB to CDB [text](#) (106)
- 301. RMAN Transportable Tablespace with Data Pump [text](#) (70)
- 302. RMAN Transportable Tablespace with Data Pump - NON-CDB to CDB [text](#) (83)
- 303. RMAN Transportable Tablespace with Data Pump - Incremental [text](#) (143)
- 304. RMAN Transportable Tablespace with Data Pump - Incremental - NON-CDB to CDB [text](#) (162)
- 305. RMAN CONVERT Transportable Tablespace with Data Pump [text](#) (90)
- 306. RMAN CONVERT Transportable Tablespace with Data Pump - NON-CDB to CDB [text](#) (104)
- 307. RMAN Cross-Platform Transportable Tablespace Backup Sets [text](#) (80)
- 308. RMAN Cross-Platform Transportable Tablespace Backup Sets - NON-CDB to CDB [text](#) (93)
- 309. RMAN Cross-Platform Transportable Tablespace Backup Sets - Incremental - XTTS [text](#) (9)
- 310. RMAN Incremental Backup [text](#) (127)
- 311. Unplugging/Plugging (NON-CDB) [text](#) (81)
- 312. Remote Cloning (NON-CDB) [text](#) (49)
- 313. Cloud Backup Module [text](#) (168)
- 314. Data Guard [text](#) (133)
- 315. Golden Gate (To be Implemented) [text](#) (1)



ORACLE DATABASE CLOUD

ORACLE SQL*LOADER



ORACLE DATABASE CLOUD

ORACLE SQL*LOADER

```
sqlplus scott/tiger
```

```
CREATE TABLE emp (empno number(5),  
name varchar2(50),  
sal number(10,2),  
jdate date);
```

ORACLE DATABASE CLOUD

ORACLE SQL*LOADER

emp.ctl

LOAD DATA

INFILE '/u01/oracle/emp.csv'

BADFILE '/u01/oracle/emp.bad' DISCARDFILE
'/u01/oracle/emp.dsc'

INSERT INTO TABLE emp

FIELDS TERMINATED BY “,” OPTIONALLY ENCLOSED BY “” TRAILING NULLCOLS
(empno,name,sal,jdate date 'mm/dd/yyyy')

sqlldr userid=scott/tiger control=emp.ctl log=emp.log

ORACLE DATABASE CLOUD

EXTERNAL TABLES



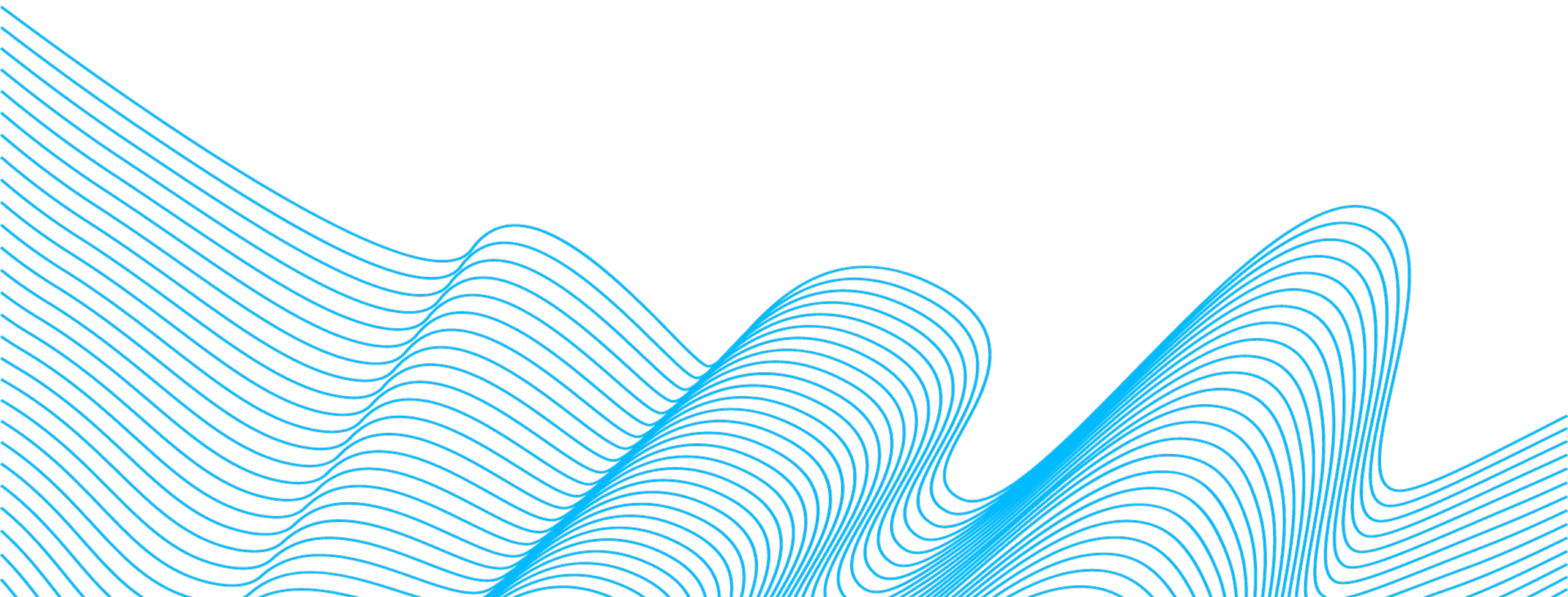
ORACLE DATABASE CLOUD

EXTERNAL TABLES

```
CREATE TABLE countries_ext (  
  country_code      VARCHAR2(5),  
  country_name      VARCHAR2(50),  
  country_language  VARCHAR2(50)  
)  
ORGANIZATION EXTERNAL (  
  TYPE ORACLE_LOADER  
  DEFAULT DIRECTORY ext_tab_data  
  ACCESS PARAMETERS (  
    RECORDS DELIMITED BY NEWLINE  
    FIELDS TERMINATED BY ','  
    MISSING FIELD VALUES ARE NULL  
  (  
    country_code      CHAR(5),  
    country_name      CHAR(50),  
    country_language  CHAR(50)  
  )  
  )  
  LOCATION ('Countries1.txt','Countries2.txt')  
)  
PARALLEL 5  
REJECT LIMIT UNLIMITED;
```

ORACLE DATABASE CLOUD

DATABASE LINKS



ORACLE DATABASE CLOUD

DATABASE LINKS

On-premises host:

```
CREATE DATABASE LINK my_db_link CONNECT TO remote_user  
IDENTIFIED BY remote_password USING 'MyCloudDB';
```

```
CREATE TABLE tb_test@my_db_link as SELECT* FROM my_Table;
```


ORACLE DATABASE CLOUD

**DATABASE LINKS - CLONE A REMOTE
PDB OR NON-CDB**



ORACLE DATABASE CLOUD

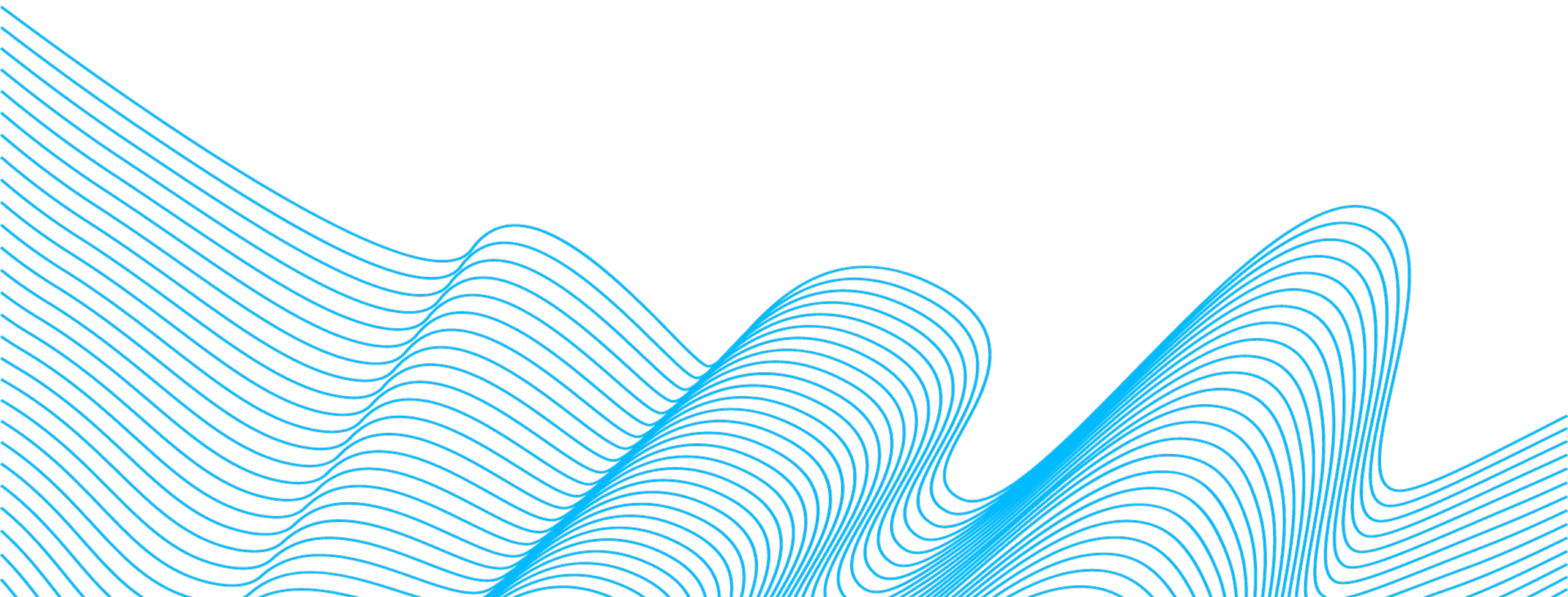
DATABASE LINKS - CLONE A REMOTE PDB OR NON-CDB

```
CREATE DATABASE LINK clone_link CONNECT TO remote_clone_user  
IDENTIFIED BY remote_clone_user USING 'MyOnPremDB';
```

```
CREATE PLUGGABLE DATABASE pdb1 FROM pdb1@clone_link;
```

```
CREATE PLUGGABLE DATABASE pdb2b FROM NON$CDB@clone_link;
```

ORACLE DATABASE CLOUD UNPLUGGING/PLUGGING



ORACLE DATABASE CLOUD

UNPLUGGING/PLUGGING

```
SQL>  
SQL> ALTER PLUGGABLE DATABASE pdb_cdb2  
2 UNPLUG INTO '/tmp/pdb_cdb2.xml';  
  
Pluggable database altered.  
  
SQL> _
```

http://www.oracle.com/webfolder/technetwork/tutorials/obe/cloud/dbaas/OU/MigratingToDBaaS/Unplug_Plug_Migration/Unplug_Plug_Migration.html

ORACLE DATABASE CLOUD UNPLUGGING/PLUGGING

```
[oracle@NFDBA ~]$ cd $HOME/.ssh
[oracle@NFDBA .ssh]$ scp -i DJkey.openssh oracle@ :/u02/app/oracle
/oradata/CDB2/pdb_cdb2/* /u02/app/oracle/oradata/ORCL/PDB_CDB2
Enter passphrase for key 'DJkey.openssh':
pdb_cdb2_users01.dbf      100% 5128KB   5.0MB/s   00:00
sysaux01.dbf             100% 580MB   10.0MB/s   00:58
system01.dbf            100% 260MB    9.3MB/s   00:28
temp012015-02-17_12-55-34-PM.dbf 100% 20MB   20.0MB/s   00:00
[oracle@NFDBA .ssh]$
```

http://www.oracle.com/webfolder/technetwork/tutorials/obe/cloud/dbaas/OU/MigratingToDBaaS/Unplug_Plug_Migration/Unplug_Plug_Migration.html

ORACLE DATABASE CLOUD UNPLUGGING/PLUGGING

```
[oracle@NFDBA .ssh]$ . oraenv
ORACLE_SID = [ORCL] ? ORCL
The Oracle base remains unchanged with value /u01/app/oracle
[oracle@NFDBA .ssh]$ sqlplus / as sysdba

SQL*Plus: Release 12.1.0.2.0 Production on Fri Feb 20 11:29:59 2015

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Connected to:
Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production
With the Partitioning, Oracle Label Security, OLAP, Advanced Analytics
and Real Application Testing options

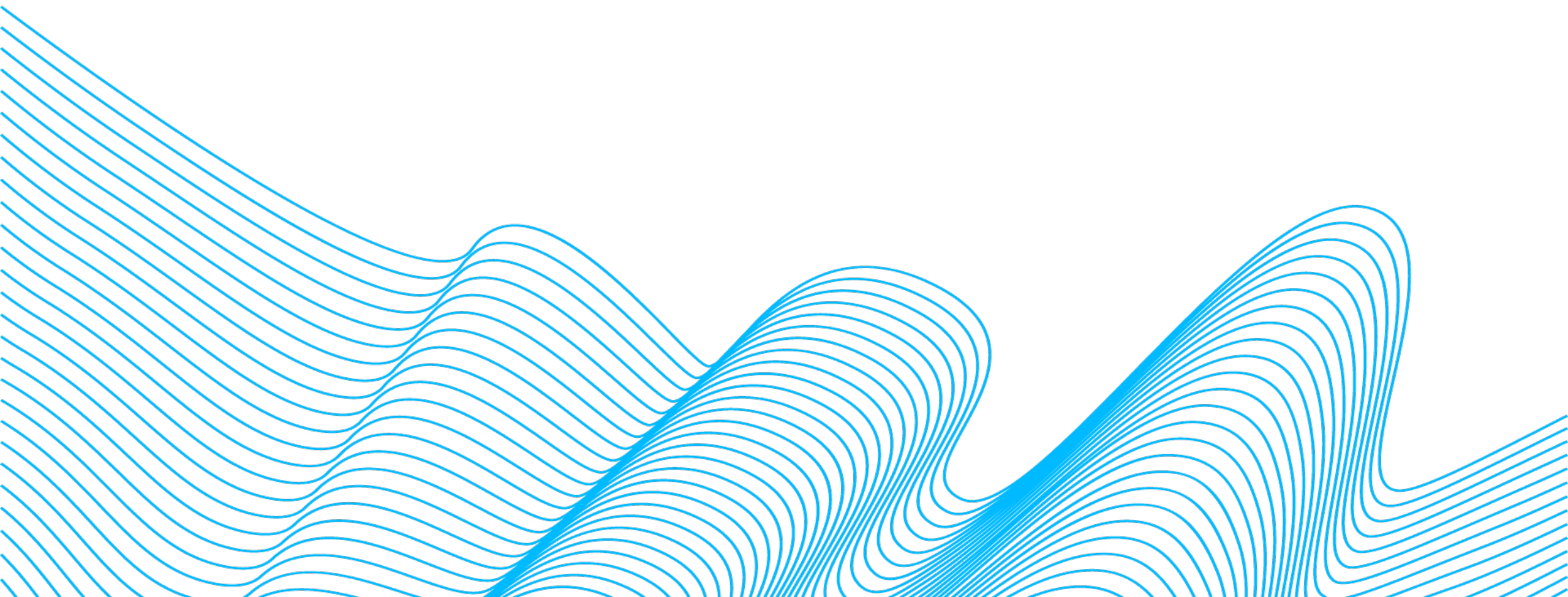
SQL> CREATE PLUGGABLE DATABASE db_cdb2
 2 USING '/u01/app/oracle/admin/ORCL/pdb_cdb2.xml'
 3 SOURCE_FILE_NAME_CONVERT = (
 4   '/u02/app/oracle/oradata/CDB2/pdb_cdb2',
 5   '/u02/app/oracle/oradata/ORCL/PDB_CDB2')
 6 NOCOPY
 7 TEMPFILE REUSE;

Pluggable database created.

SQL>
```

http://www.oracle.com/webfolder/technetwork/tutorials/obe/cloud/dbaas/OU/MigratingToDBaaS/Unplug_Plug_Migration/Unplug_Plug_Migration.html

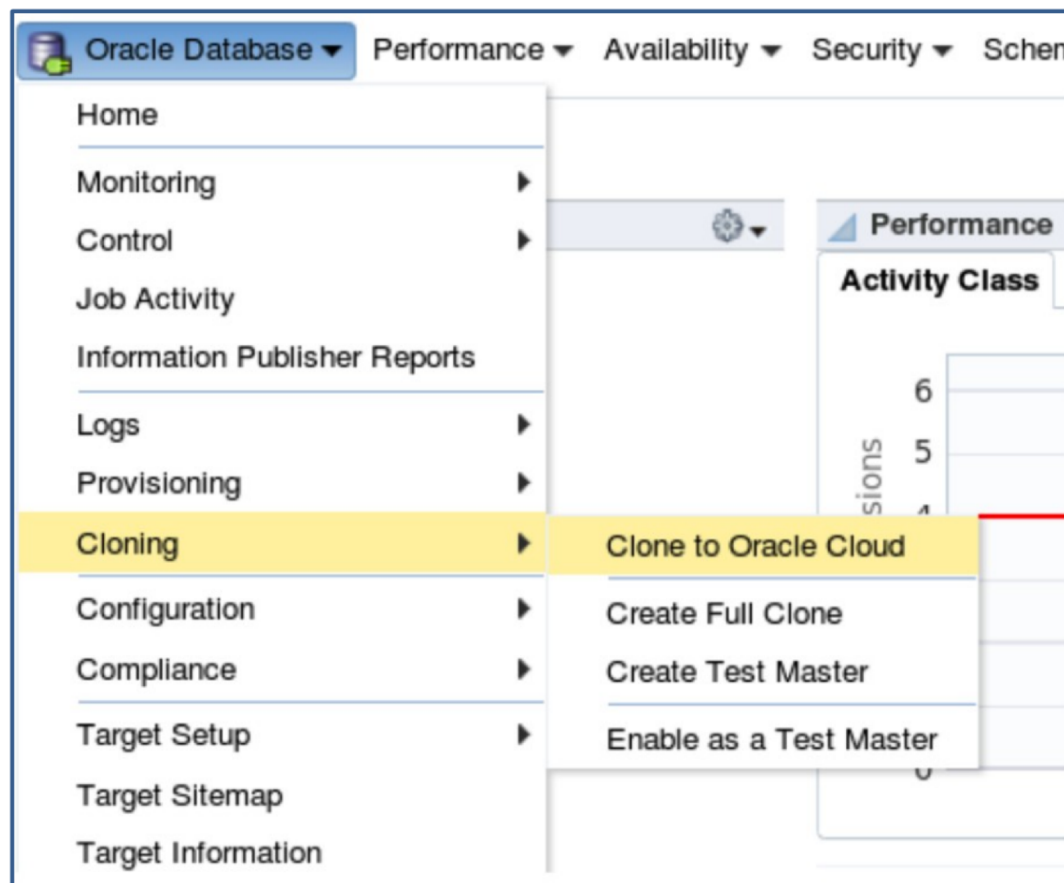
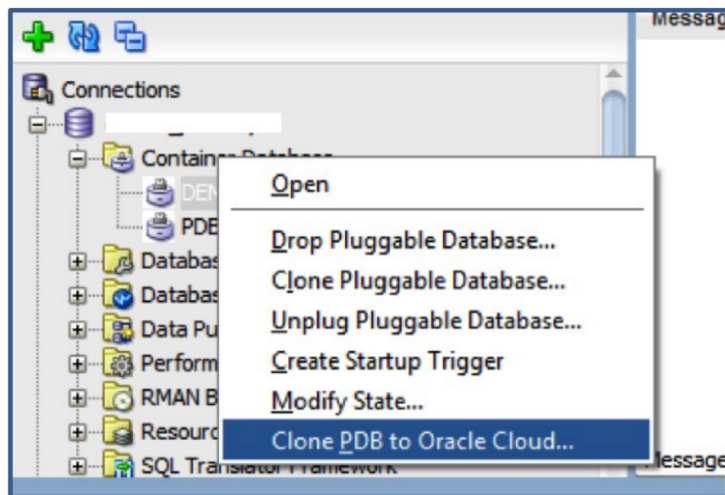
ORACLE DATABASE CLOUD **PLUGGABLE DATABASES (PDBS) -** **REMOTE CLONING**



ORACLE DATABASE CLOUD PLUGGABLE DATABASES (PDBS) - REMOTE CLONING

Enterprise Manager

SQLDEVELOPER



ORACLE DATABASE CLOUD PLUGGABLE DATABASES (PDBS) - REMOTE CLONING

The screenshot displays the Oracle Enterprise Manager Cloud Control 12c interface. The top navigation bar includes 'Enterprise', 'Targets', 'Favorites', and 'History'. The main content area shows a navigation tree on the left with 'Cloning' selected, and a context menu open with options: 'Clone to Oracle Cloud', 'Create Full Clone', 'Create Test Master', and 'Enable as a Test Master'. The main pane shows 'Incidents and Problems' with a table header and a 'Compliance Summary' section below it.

Oracle Enterprise Manager Cloud Control 12c

Setup | SYSMAN

Enterprise | Targets | Favorites | History | Search Zielname

Oracle Database | Performance | Availability | Security | Schema | Administration

Page Refreshed

Auto Refresh Off

Cloning

- Clone to Oracle Cloud
- Create Full Clone
- Create Test Master
- Enable as a Test Master

Incidents and Problems

View | Target | Local target and related targets | Category | All | 0 | 0 | 0 | 0

| Summary | Target | Severity | Status | Escalation Level | Type | Time Since Last Update |
|--|--------|----------|--------|------------------|------|------------------------|
| No matching incidents or problems found. | | | | | | |

Compliance Summary

View Trends

| Compliance Standard | Average Score |
|---------------------|---------------|
| No data to display | |

Jobs Running

Columns Hidden 14 | Updated in the last 31 days

ORACLE DATABASE CLOUD PLUGGABLE DATABASES (PDBS) - REMOTE CLONING

ORACLE Enterprise Manager Cloud Control 12c SYSMAN

CRM02

Source and Destination: Clone to Oracle Cloud Advanced Clone Cancel

Source

Details

Pluggable Database T [REDACTED]
Container Database T [REDACTED]
Database Version 12.1.0.2.0

Credentials

* SYSDBA Container Database Credentials NC_ [REDACTED] 🔍
* Database Host Credentials NC_HOST [REDACTED] 🔍

Destination

Pluggable Database Definition

* Pluggable Database Name C [REDACTED]
* Display Name C [REDACTED]

PDB Administrator Credentials

* User Name C [REDACTED]
* Password
* Confirm Password

Container Database

* Container Database T [REDACTED] 🔍
Site Oracle Cloud ☁️

Credentials

* SYSDBA Container Database Credentials NC_ [REDACTED] 🔍
* Database Host Credentials CLOUD_CREDENTIAL 🔍

https://172.16.19.83:50027/em/faces/adf.task-flow?adf.tfId=pdb-datarefresh-clone-task-flow&adf.tfDoc=/WEB-INF/db/pdb/datarefresh/clone/pdb-datarefresh-clone-task-flow.xml&_afLoop=1489754491277560#

ORACLE DATABASE CLOUD PLUGGABLE DATABASES (PDBS) - REMOTE CLONING

ORACLE Enterprise Manager Cloud Control 12c

Setup | SYSMAN

Enterprise | Targets | Favorites | History | Search Zielname

Provisioning

Switch to Classic View

Procedure Activity: Clone_to_Oracle_Cloud_SYSMAN

View Data | Real Time: Manual Refresh | Procedure Actions

Elapsed Time: N/A (Scheduled)

| | | |
|----------------------------------|----------------|------------------------------|
| Run Clone_to_Oracle_Cloud_SYSMAN | Scheduled | Elapsed Time N/A (Scheduled) |
| Procedure PDB Clone | Start Date | Execution Id |
| Owner SYSMAN | Last Updated | |
| Status Scheduled | Completed Date | |

Procedure Steps

View | Show All Steps

| Select | Name | Status |
|--------|---|--------|
| | Initialize | |
| > | Prepare for cloning (OS Image Backup) | |
| > | Prepare for cloning (Unplug/Plug) | |
| > | Prepare for cloning (Use an Existing Backup) | |
| > | Prepare Backup at Destination | |
| > | Prepare SQL for creating clone | |
| > | Execute pre database creation custom script | |
| > | Execute Create PDB SQL Script | |
| > | Restore source PDB to its original state | |
| > | Apply Datapatch | |
| > | Post clone PDB creation operation | |
| > | Execute post database creation scripts | |
| > | Configure Database diskgroup and datafiles. | |
| > | Open the cloned PDB in read only mode if required | |
| > | Populate Target Properties | |
| > | Clean Up | |

Information

Select an execution step from the Procedure Steps tree on the left to see the details.

ORACLE DATABASE CLOUD PLUGGABLE DATABASES (PDBS) - REMOTE CLONING

The screenshot displays the Oracle Enterprise Manager Cloud Control 12c interface. The main heading is "Provisioning". Below it, the "Procedure Activity: Clone_to_Oracle_Cloud_SYSMAN" is shown, indicating it has completed successfully with an elapsed time of 31 minutes and 14 seconds. A table lists the procedure details: Run Clone_to_Oracle_Cloud_SYSMAN, Procedure PDB Clone, Owner SYSMAN, and Status Succeeded. The "Procedure Steps" section shows a list of tasks, with "Apply Datapatch" selected and expanded to show its details: Type Procedure Step, Elapsed Time 21 minutes, 10 seconds, and Status Succeeded.

| Run | Scheduled | Elapsed Time |
|------------------------------|------------|--------------|
| Clone_to_Oracle_Cloud_SYSMAN | Start Date | Execution Id |

| Procedure | Last Updated | Completed Date |
|-----------|--------------|----------------|
| PDB Clone | | |

| Select | Name | Status |
|-------------------------------------|--|--------|
| <input type="checkbox"/> | Initialize | ✓ |
| <input type="checkbox"/> | Prepare for cloning (OS Image Backup) | ✓ |
| <input type="checkbox"/> | Prepare for cloning (Unplug/Plug) | ↻ |
| <input type="checkbox"/> | Prepare for cloning (Use an Existing Backup) | ↻ |
| <input type="checkbox"/> | Prepare Backup at Destination | ↻ |
| <input type="checkbox"/> | Prepare SQL for creating clone | ✓ |
| <input type="checkbox"/> | Execute pre database creation custom script | ↻ |
| <input type="checkbox"/> | Execute Create PDB SQL Script | ✓ |
| <input type="checkbox"/> | Restore source PDB to its original state | ↻ |
| <input checked="" type="checkbox"/> | Apply Datapatch | ✓ |
| <input type="checkbox"/> | Initialize | ✓ |
| <input type="checkbox"/> | Patch PDB | ✓ |
| <input type="checkbox"/> | 160.34.12.129 | ✓ |

| Type | Procedure Step | Start Date |
|-----------------|----------------|------------|
| Apply Datapatch | | |

| Elapsed Time | Completed Date |
|------------------------|----------------|
| 21 minutes, 10 seconds | |

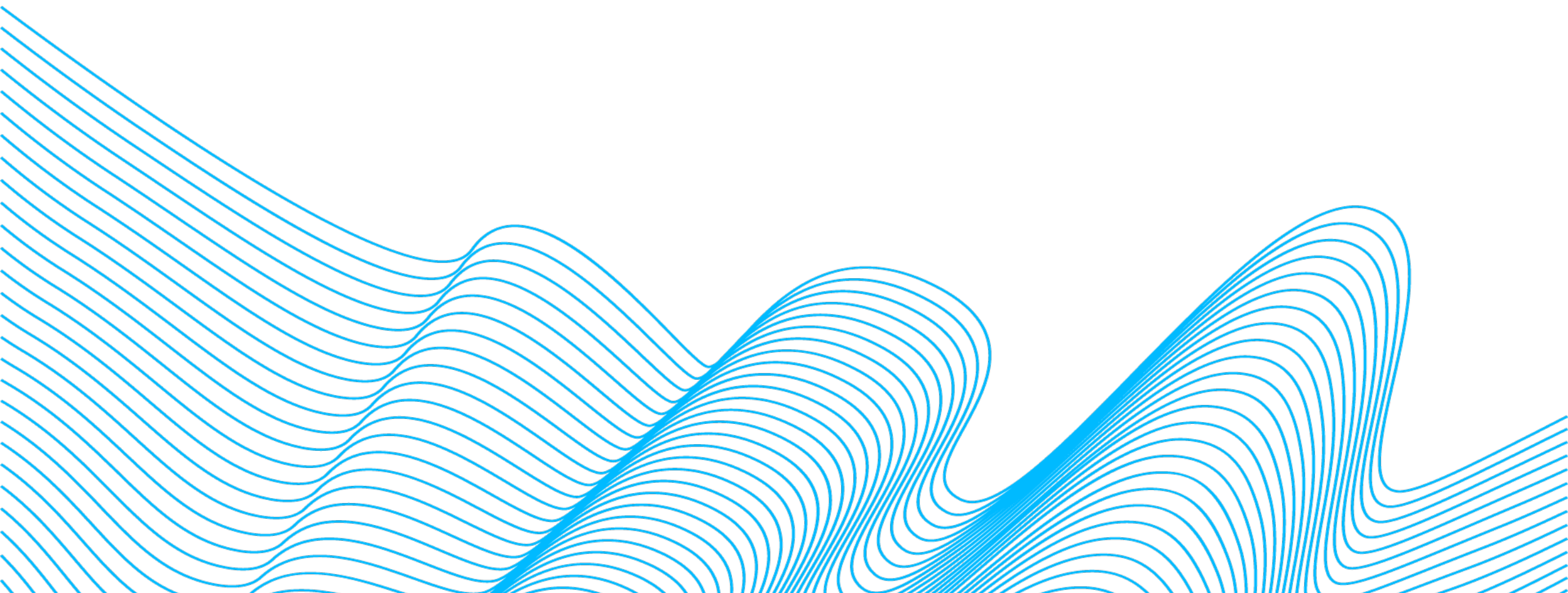
Succeeded

ORACLE DATABASE CLOUD PLUGGABLE DATABASES (PDBS) - REMOTE CLONING

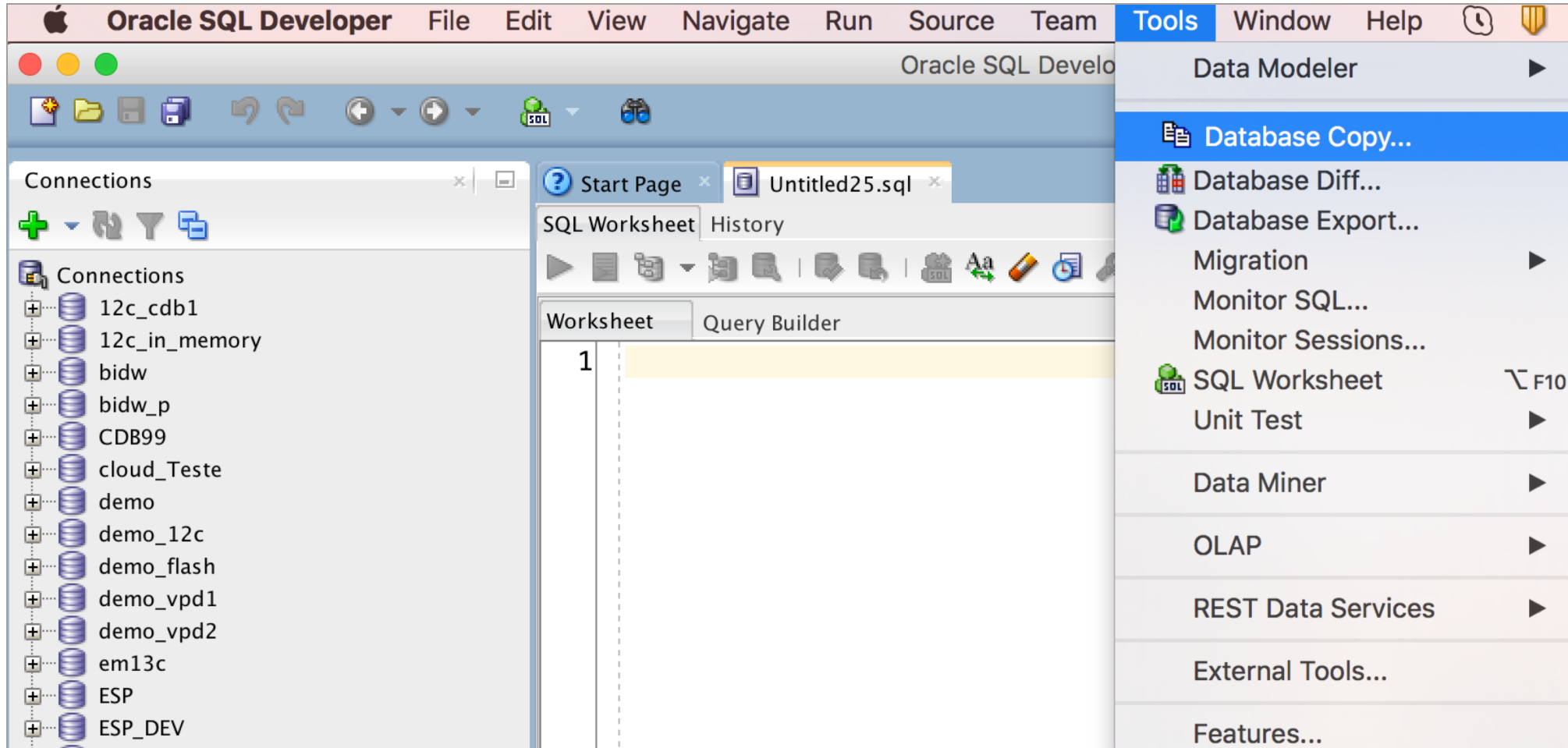
The screenshot displays the Oracle Enterprise Manager Cloud Control 12c interface. The top navigation bar includes 'Enterprise', 'Targets', 'Favorites', and 'History'. A search bar is present with the text 'Search Zielname'. Below this, the 'Databases' section is active, showing a search for 'CRM02_CL'. The search results table is as follows:

| Name | Type | Status | Target Version | Incidents | | | Average Compliance Score | Member Status Summary | | | |
|-------------------------------|-------------------------------|--------|----------------|-----------|---------|-------|--------------------------|-----------------------|---------|-------|----|
| | | | | Down | Warning | Alert | | Down | Warning | Alert | Up |
| Database Instance : Container | Database Instance : Container | Up | 12.1.0.2.0 | 0 | 0 | 0 | n/a | 0 | 3 | 0 | 0 |
| Pluggable Databases | | n/a | | 0 | 0 | 0 | n/a | 0 | 3 | 0 | 0 |
| Pluggable Database | Pluggable Database | Up | 12.1.0.2.0 | 0 | 0 | 0 | n/a | 0 | 0 | 0 | 0 |

ORACLE DATABASE CLOUD **SQLDEVELOPER DATABASE COPY**



ORACLE DATABASE CLOUD SQLDEVELOPER



ORACLE DATABASE CLOUD SQLDEVELOPER

Database Copy Wizard - Step 1 of 6

Source/Destination

Source Connection: v_source

Destination Connection: v_dest

Copy Options

- O**bjects Copy
 - M**aintain Schemas **C**onsolidate Schemas
- S**chemas Copy
- T**ablespace Copy

Copy DDL

- D**o not replace existing destination objects
- R**eplace existing destination objects

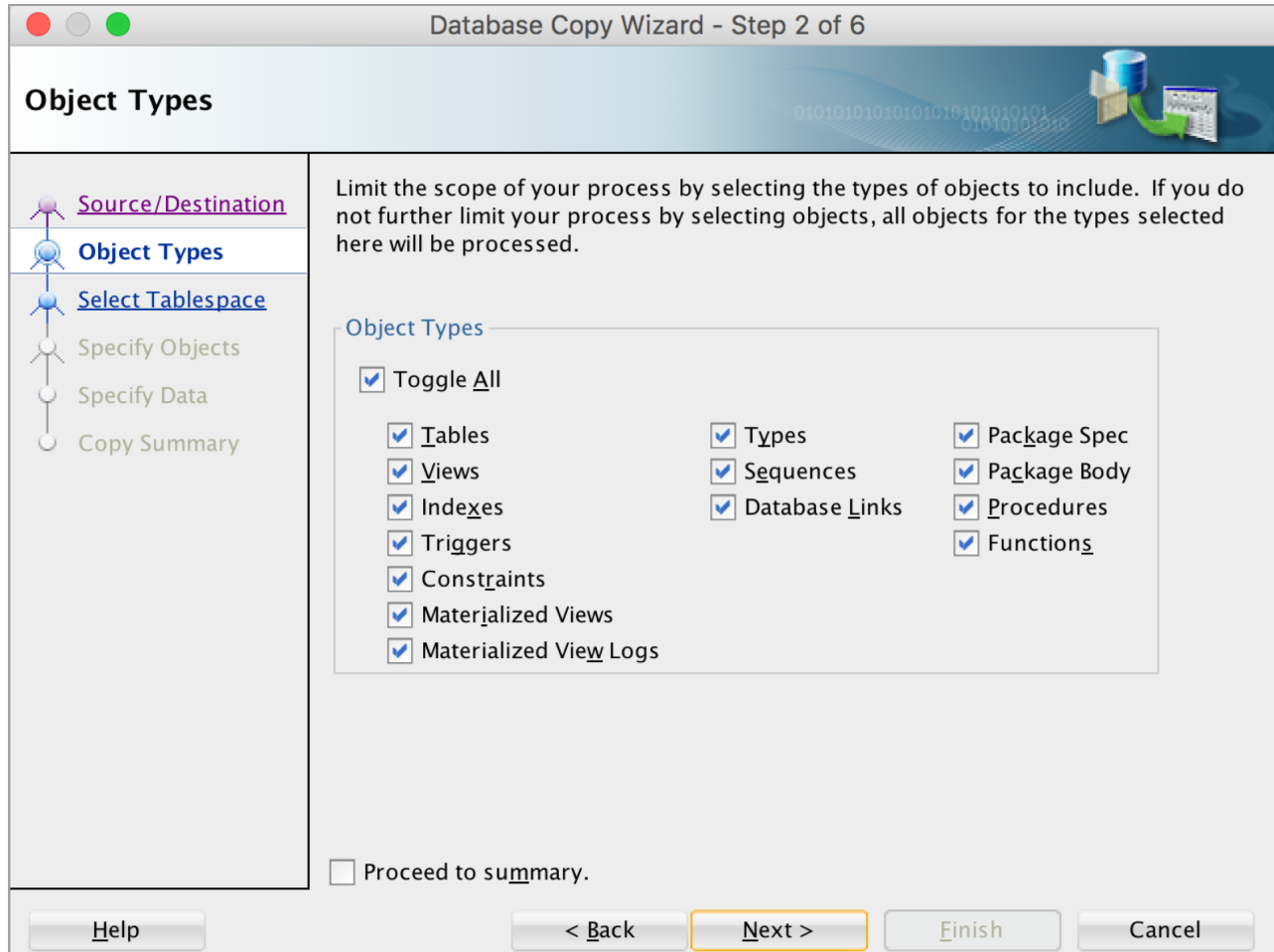
Copy Data

- T**runcate destination data before copying

Proceed to summary.

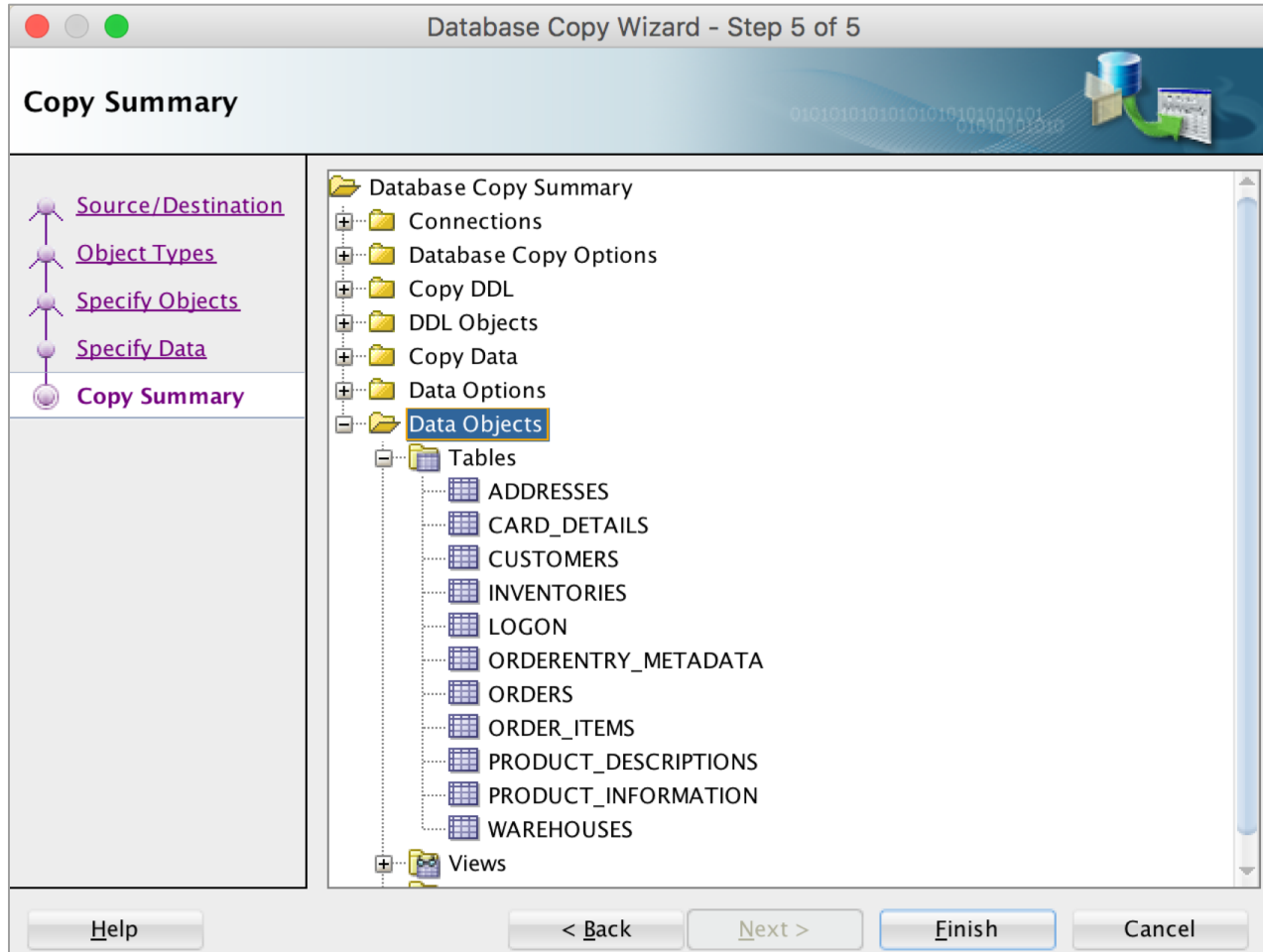
Help < Back Next > Finish Cancel

ORACLE DATABASE CLOUD SQLDEVELOPER

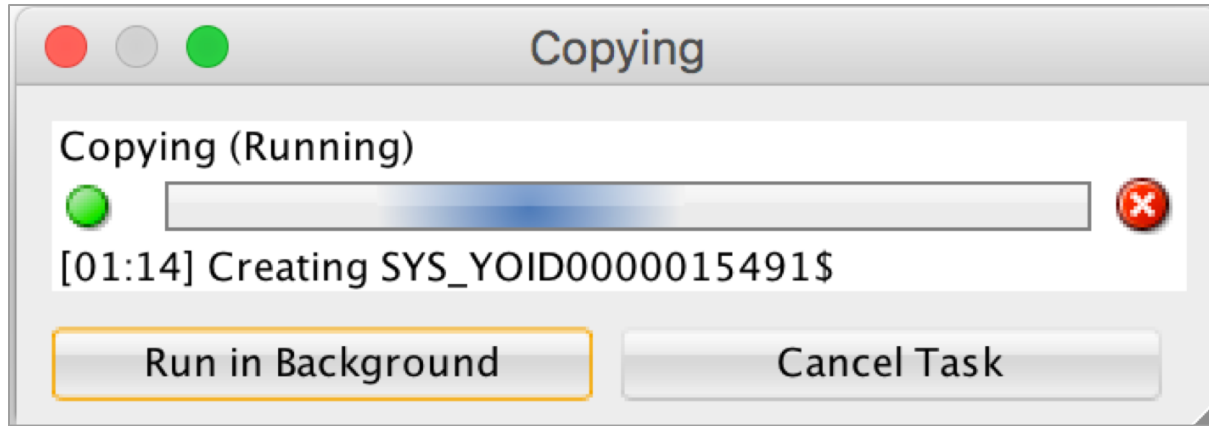


ORACLE DATABASE CLOUD

SQLDEVELOPER



ORACLE DATABASE CLOUD SQLDEVELOPER



ORACLE DATABASE CLOUD

SQLDEVELOPER

```
--- START -----
set define off;

-----
-- DDL for Table COUNTRIES
-----

CREATE TABLE "COUNTRIES" ("COUNTRY_ID" CHAR(2 BYTE), "COUNTRY_NAME" VARCHAR2(40 BYTE), "REGION_ID" NUMBER, CONSTRAINT "COUNTR

COMMENT ON COLUMN "COUNTRIES"."COUNTRY_ID" IS 'Primary key of countries table.';
COMMENT ON COLUMN "COUNTRIES"."COUNTRY_NAME" IS 'Country name';
COMMENT ON COLUMN "COUNTRIES"."REGION_ID" IS 'Region ID for the country. Foreign key to region_id column in the departments t
COMMENT ON TABLE "COUNTRIES" IS 'country table. Contains 25 rows. References with locations table.';

Table "COUNTRIES" created.

Comment on column "countries"."country_id" 'PRIMARY KEY OF COUNTRIES TABLE.' succeeded.

Comment on column "countries"."country_name" 'COUNTRY NAME' succeeded.

Comment on column "countries"."region_id" 'REGION ID FOR THE COUNTRY. FOREIGN KEY TO REGION_ID COLUMN IN THE DEPARTMENTS TABLE.'

Comment on table "countries" 'COUNTRY TABLE. CONTAINS 25 ROWS. REFERENCES WITH LOCATIONS TABLE.' succeeded.

set define off;
```

OTHER OPTIONS TO EXPLORE

- Oracle Zero Downtime Migration
- MV2ADB
- MV2OCI
- Ansible Database Migration Tool utility

QUESTIONS?



THANK YOU

Slides will be available at www.slideshare.net

...whatever you do, do it all for the glory of God.

1 Corinthians 10:31

