Página 1
ORACLE
University
Oracle Autonomous Database
Using REST APIs to Manage ADB
Kamryn Vinson
SENIOR PRODUCT MANAGER, DATABASE
ORACLE

Página 2

Autonomous Database: REST APIs

Oracle's Cloud offers full REST APIs for DBAs and developers. All the functionality provided in the console is available using REST APIs.

It's a mechanism for developing customized deployment and management scripts that can be saved and reused for deployments.

Oracle Cloud Infrastructure APIs are typical REST APIs that use HTTPS requests and responses and support HTTPS and SSL protocol TLS 1.2, the most secure industry standards.

Calls to the Oracle Cloud Infrastructure using REST APIs can be written in popular scripting languages such as node.js, Python, Ruby, Perl, Java, C#, bash or curl.

Página 3

Autonomous Database: REST APIs

All Oracle Cloud Infrastructure API requests must be signed for authentication purposes.
The steps to create and sign API requests are:

- Form the HTTPS request (SSL protocol TLS 1.2 is required).

- Create the signing string, which is based on parts of the request.

- Create the signature from the signing string, using your private key and the RSA-SHA256 algorithm.

- Add the resulting signature and other required information to the Authorization header in the request.

- You will also need to generate an SSH key pair in the pem format.
  These avoid using usernames/passwords and are based on the **draft-cavage-http-signatures-O8** specification for secure communication over the Internet.

Página 4
Autonomous Database: REST APIs
Create Autonomous Database: Example
This example creates an Autonomous Database in the Phoenix data center, with a database name of

"adatabasedb1," the specified password, 8 CPUs and 1 TB of storage:
POST /20160918/autonomousDatabases
Host: database.us-phoenix-1.oraclecloud.com
<authorization and other headers>
{ "compartmentid":
ocid1.tenancy.ocl.exampleah2sauv373xyfrpcnased2pt
fy6f7nspyyda2hacgdbrk1jexample",
"displayName": "example_autonomous_database",
"dbName": "adatabasedb1",
"adminPassword": "<password>",
"computeCount": 8,
"dataStorageSizeInTBs": 1
}

Página 5

The response will include the current status of the create process and other relevant information regarding the database being created. The response will always be similar for any command, so for the examples in the next pages, you will see similar responses:
{
"compartmentId" : "ocid1.temancy.ocl.exampleah2sauv373xyfrpcmaed2ptfy67fns
prydaZhaogdbrkijexample",
"displayName" : "example_autonomous_database",
"id" : "ocid1.autonomousdatabas.ocl.phx.examplerojzggj3o5eh2okamyhsikksxrpen
cikhbqu5yueyfdbetexample",
"dhName" : "adetabasedbl",
"liZoyolsGate" : "PROVISIONING",
"timeCreated" : "2023-11-23T01:59:07.0327"
"computeCount" : 0,
"dataStorageSizeInTBe" : 1,
"licenseModel" : "LICENSE_INCLUDED",
"serviceConsoleUrl" : "https://adwc.uscom-east-1.orsalecloud.com/console/index.
html?tenant_name=iam
-ocid1.temancy.ocl.exampleah2sauv373xyfrpcmaed2ptfy67fnsprydaZhaogdbrkijexample+
database_name=adwdbbl"
}

Página 6

Autonomous Database: REST APIs
Other Autonomous Database: Example
The following examples show you how to delete, start, and stop
an autonomous database through REST APIs:
DELETE /20160918/autonomousDatabase</autonomousDatabaseId>
Host: database.us-phoenix-1.oraclecloud.com
<authorization and other headers>
POST
/20160918/autonomousDatabase</autonomousDatabaseId>/actions/start
Host: database.us-phoenix-1.oraclecloud.com

<authorization and other headers>
POST
/20160918/autonomousDatabase</autonomousDatabaseId>/actions/stop
Host: <u>database.us-phoenix-1.oraclecloud.com</u>
<authorization and other headers>

Página 7
In the first example, the ECPU count is set to 20. In the second example, a Monthly Backup is initiated.
PUT /20160918/autonomousDatabase<autonomousDatabaseId>
Host: <u>database.us-phoenix-1.oraclecloud.com</u>
<authorization and other headera>

```
{
"computeCount": 20
}
```

POST /20160918/autonomousDatabaseRackups
Host: <u>database.us-phoenix-1.oraclecloud.com</u>
<authorization and other headersa>

```
{
"autonomousDatabaseId" :
"ocid1.autonomousdatabase.ocl.phx.examplervkwamqmkukhluitmxsqupmqpw21
t4j6f4dmrkargk4ysjexample",
"displayName" : "Monthly Backup"
}
```

Archivo: 7.2_Autonomous Database Built In Tools (Oracle Data Platform Foundations Associate).pdf

Página 1
ORACLE
University
Oracle Database
Describe Oracle's Data Toolset

Página 2
Autonomous Database with Built-In Tools Benefits All Players
Data Scientist
Integrator
DBA
Developer
Analyst

Página 3
Data Analysis in the Traditional Market
Best-of-breed, enterprise-class tools, tailored for the specialist
Oracle Data Integrator
Data load

Oracle Enterprise Data Quality
Data prep
Semantic modeling
Data analysis

Whole > Sum (Parts)

Benefits of integration are multifaceted

- Integrated toolset
    - Preassembled
    - Preconfigured
    - Pre-deployed
    - Consistent UX
    - Best practices instantiated
- Common components
    - Business model
    - Catalog
- Integrated data
    - Federated model
    - Common catalog
    - Silos eliminated
    - Common data sources
    - Confidence in lineage
    - Impact analysis
      Collaboration by design

Whole > Sum (Parts)

Collaboration by design

- Data Analyst
- Application Developer
- Data Integrator

- Data Scientist

Derive Insights from Data

Open platform – nothing new to learn
SQL
[JSON]
SPOKEN HERE
CSV

Your favorite analytics tool

Built-In Tool Suite

Nothing more to buy or install

ORACLE LOGO

Search for resources, services, and documentation

Overview - Autonomous Database - Autonomous Database Routes

 MOVIESTREAM_PGW

Database Address   Bit Connection Performance Hub Service Console Mem Actions

---

ADW

Autonomous Database Information
Tools
Tags

Oracle Application Express

Oracle Application Express (APEX) is a low-code development platform that enables rapid application development and deployment. Last accessed:
Open APEX

SODA Drivers

Simple Oracle Document Access (SODA) is a set of APIs that let you work with JSON documents in Oracle Database. SODA drivers are available in Java, Node.js, Python, PL/SQL, etc. Last

accessed:
Download SODA Drivers

Metrics

- Start time: 0x15 min

- Data Status: 1

Oracle ML User Administration

Oracle Machine Learning User Administration is an interface that allows users to monitor and manage their machine learning models. Last accessed:
Open Oracle ML User Administration

Graph Studio

Oracle Graph Studio is an interface that simplifies the creation of graph models and in-memory graphs for applications.

Open Graph Studio

- [ ] [ ]

Página 8

Built-In Tool Suite

Nothing more to buy or install

Checkout Information (Events)

Development

- **SQL Worksheet**

  - Execute SQL and PL/SQL, and access database objects

- **REST Data Services**

  - Data/JSON APIs for your database

- **APEX**

  - Build web applications quickly

Administration

- **Database Actions**

    - Create and manage database objects, and find valuable information

Data Tools

- **Data Load**

    - Load or process data from local files or cloud storage

- **Data Transform**

    - Obtain statistics, values and content patterns in your data

- **Data Pump**

    - Process the program with transformers and training

Monitoring

- **Performance Hub**

    - Oversee performance and activity of the database

Getting Started

- **Quick Start**

    - Create notebooks using data, link, and data.

Software Storage

- **Object Storage**

    - Software storage is a key tool.

Codeware

- **Code Repository**

    - Request permissions, logs, files, and other tools such as code, debugging, and testing.

APIs

- **REST APIs**

    - Use APIs to help developers work with data.

Need Help?

- **Community**

    - Use Oracle Community Forums and To Manage or Create

Data Load

Data Load | Load data

What do you want to do with your data?

- LOAD DATA

    - Load data into your autonomous database

- LINK DATA

    - Create a link to data and let your autonomous database access it.

- FEED DATA

    - Share the ground-based cross-data map over automated databases

---

Where is your data?

- LOCAL FILE

    - Selected files from your local device

- DATABASE

    - Selected files from your remote database

- CLOUD STORAGE

    - Selected files from cloud storage (AWS S3, Azure Blob, Google Cloud Storage)

Explore and Connect

- EXPLORE

    - Inspect data in your autonomous database

- DATA LOAD JOBS

    - Check your Data Load Jobs

- CLOUD LOCATIONS

    - Manage cloud storage locations (AWS, Azure, Google Cloud)

Getting Started

Data Load:

- Select a file to load. You can also load data from cloud storage.

- **Explore**

- Inspect data in your autonomous database.
- **Manage**
- Manage your cloud storage locations.

Need Help?

Community:

- OCI Developer Community Forum
- OCI Developer on Twitter

Simple "drag-and-drop" data loading

- Files on local computer
- Files in Cloud Storage (including AWS S3 and Azure Blob Storage)
- Oracle Databases (on premises and in cloud)

Página 10
Data Load
Data Load / Load data
Drag-and-drop data load:

- From local files
- From Object Storage

Página 11

Data Load

AWS S3

Azure Blob Storage

- **Azure Blob Storage**

Drag-and-drop data load:

- From local files
- From Object Storage

Data Load

Data Load | Load data

What do you want to do with your data?

- LOAD DATA

    - Load data into your autonomous database.

- LINK DATA

    - Create a link to data in cloud storage.

- FEED DATA

    - Stream data into your autonomous database.

Where is your data?

- LOCAL FILE

    - Selected files from your local device

- DATABASE

    - Selected files from your remote database

- CLOUD STORAGE

    - Selected files from cloud storage (AWS S3, Azure Blob, Google Cloud Storage)

Explore and Connect

- EXPLORE

    - Inspect data in your autonomous database

- DATA LOAD JOBS

    - Check your Data Load Jobs

- CLOUD LOCATIONS

    - Manage cloud storage locations (AWS, Azure, Google Cloud)

Getting Started

Data Load:

- Select a file to load. You can also load data from cloud storage.
  Explore

- Inspect data in your autonomous database.
  Manage

- Manage your cloud storage locations.

Need Help?

Community:

- OCI Developer Community Forum

- OCI Developer on Twitter

Profile data after loading.

- Click the **Explore** card.

- Select the table.

- Press **Statistics.**

Página 13

Data Load

Data Load | Load data

Owner: SCHEMA AND Table for your DATA

Filters

- **Status**:

  - All

  - Loaded

- **Attributes**:

  - Yes

  - No

- **External**:

- Yes

- No

- **Shared**:

  - Yes

  - No

Showing 8 tables

- **MOVIE_SALES_2020**

  - [Table]

  - [X, optional]

- **Application: GUIDABLE**

  - User: "GET YOUR SALES_NAME"

- **Application: WORKING_SIZE/SERVE**

  - [X, optional]

- **MONTHS**

  - [Table]

  - [X, optional]

- **Application: GUIDABLE**

  - User: "GET YOUR SALES_NAME"

- **Application: WORKING_SIZE/SERVE**

  - [X, optional]

- **COUNTRIES**

  - [Table]

  - [X, optional]

- **Application: GUIDABLE**

  - User: "GET YOUR SALES_NAME"

- **Application: WORKING_SIZE/SERVE**

  - [X, optional]

Suggestions

- **Recent objects**:

- Domestic content or modified catalog certificate from 18 clients

- Vendor configured across default services and customer based on proprietary query or user preferences

- A database

- Tables stored by SCHEMA

- Installed tables

- Unix feed tables

- Business models

- Trading, game and analytic views owned by SCHEMA

Profile data after loading.

- Click the Explore card.

- Select the table.

- Press Statistics.

Página 14

Data Load

3. Check Out Smart Sound Control

- **Smart: SCHEMA AND Table for your DATA**

- **Showing 8 tables**

- **Statistics**

- **Data Load Jobs**

- **Data Distribution**

MOVIE_SALES_2020

Process	Table Size (in bytes)	21201000	Number of Rows	541227
Columns	COLUMN1		COLUMN2	
Inputs		Initial Share Details		
Statistics		Allow HTMS		
Data Load Jobs	Initial Update (DATE)			
Data Distribution	Total 127,000			
Name (DATE)				
Phone (DATE)				

Process	Table Size (in bytes)	21201000	Number of Rows	541227

Distance 84,046.9

COLUMN3

Port (DATE)

Port (DATE)

Distance (DATE)

AUT (NUMBER)

Port (DATE)

Distance 12346.9

COLUMN4

Identify data quality problems.

Página 15

Data Load

1. Check Out Smart Menu | Cancel

Home: SCHEMA and Table for your DATA

Filter **Showing 8 tables**

Status

All

Loaded

Attributes

Yes

No

External

Yes

No

Shared

Yes

No

MOVIE_SALES_2020

- **Process**

    - Google

    - Project

    - Statistics

- Data Load Jobs
- Data Distribution

Table Size (in bytes):

2,037,000

- Number of Rows:
  5,012,227
- Total Name: MOVIE_SALES_2020
- Return to Value: #EDDY
- Number of Items: #Recordage
- Add Value: 6
- Add Payments: FREQ.DUPTC

Index (DTM):
- **HORROR (DNK)**
- **EXPLORANT (DDK)**
- **SUNDAY (TEM)**

Function (DTF):
- **HORROR (DNK)**
- **INFORMATION (TDK)**

Identify data quality problems.
- 12 months
  (we only want 3)
- 14 days in a week!
- Drill in to investigate:
  – Inconsistent letter case

Página 16

Data Load

Summary of demonstration

Context of demonstration | Content

What do you want to do with your data?

- LOAD DATA

    - Load data into your autonomous database.

- LINK DATA

    - Create a link to data in cloud storage.

- FEED DATA

    - Stream data into your autonomous database.

Where is your data?

- LOCAL FILE

    - Selected files from your local device

- DATABASE

    - Selected files from your remote database

- CLOUD STORAGE

    - Selected files from cloud storage (AWS S3, Azure Blob, Google Cloud Storage)

Getting Started

- **Data in parallel**:

    - Load data from multiple sources.

    - Load data in parallel.

    - Load data from cloud storage.

- **Need Help?**

    - Data compression:

        - Data compression: Command of access

        - SQL component: On request
          Simple "drag-and-drop" data loading

- Files on local computer

- Multiple locations
- Different file types
- Files in Cloud Storage
Inspect loaded data
    - Identify quality problems.

Explore and Connect

- EXPLORE
    - Inspect data in your autonomous database
- DATA LOAD JOBS
    - Check your Data Load Jobs
- CLOUD LOCATIONS
    - Manage cloud storage locations (AWS, Azure, Google Cloud)

Archivo: 7.3_CI_CD for APEX and Oracle DB Developers - Part 1 (Oracle Data Platform Foundations Associate).pdf

Página 1
ORACLE
University
Oracle Cloud Infrastructure
CI/CD for APEX and Oracle Database Developers

Página 2
What is CI/CD?

Página 3
What is CI/CD and why do we need it?
Cognitive
Helps in automating processes
CI/CD
Continuous Integration
Introduces automation into all stages of
app/database development
Continuous Delivery/
Deployment

Página 4
What is CI/CD and why do we need it?
CI automates
Merging the Codes Unit Testing and Functional Testing
Repository

Página 5

What is CI/CD and why do we need it?

Repository

Consistency

Everyone's on

same page

Página 6

What is CI/CD and why do we need it?

Merging the Codes

Repository

Are they following coding/

security standards ?

Página 7

What is CI/CD and why do we need it?

Repository

Find quality issues a lot faster

Página 8

What is CI/CD and why do we need it?

CD automates

Testing on pre-prod env followed by testing on

prod env

Repository

Completely automated way

Página 9

CI/CD with the database and APEX?

Multiple Users sharing single instance

Compile

Package 1

Monday Morning

Compiled Package v1

Página 10

CI/CD with the database and APEX?

Multiple Users sharing single instance

Package 1

Compiled Package v2

Compile

Monday Night

Página 11

CI/CD with the database and APEX?

Multiple Users sharing single instance

Search for v1

Package 1

Tuesday Morning

What's SQLcl?
Download
Connect to any database

Página 21
SQLcl and Liquibase
What's SQLcl?
Download
Any database

Página 22
SQLcl and Liquibase
What's SQLcl?
Liquibase
One of the features of SQLcl
Tracking database schema changes
Managing database schema changes
Applying Database Schema changes
Change logs
Database tables

Página 23

SQLcl and Liquibase

What's SQLcl?

- **Liquibase**
  One of the features of SQLcl

- **Environment to environment in a manual or automated way**

- **Tracking database schema changes**
  Managing database schema changes
  Applying Database Schema changes

- **Change logs**
  Database tables

Página 24
SQLcl and Liquibase
What's SQLcl?
Gets updated frequently
Tracking database schema changes
Managing database schema changes
Applying Database Schema changes
Change logs
Database tables
Liquibase
One of the features of SQLcl

Liquibase and SQLcl

DATABASECHANGELOG_DETAILS is a view that consolidates information from the DATABASECHANGELOG and DATABASECHANGELOG_ACTIONS tables.

DATABASECHANGELOG_ACTIONS

id	sequence	sql	sent	author	filename	
1	ttjzabdcdc4a5b6a.	0	CREATE TABLE...	twif	(SMOT)-Generated	mys2rt3_tables.xml
2	yxptzndr9f8dc7da..	0	CREATE TABLE...	twif	(SMOT)-Generated	temp_tables.xml
3	ttjzabdcdc4a5b6a.	-eleged	-eleged	(SMOT)-Generated	mys2rt3_tables.xml	

Emp table created with thousands of record on Sunday

Emp Id	First_name	Last_name	Dept Id	Salary
100	Alan	Bell	10	4000
101	Ben	Pollock	10	3500
102	Chris	Ryan	12	4250

901670
Brian
Mox
T2

Liquibase and SQLcl

DATABASECHANGELOG_DETAILS is a view that consolidates information from the DATABASECHANGELOG and DATABASECHANGELOG_ACTIONS tables.

DATABASECHANGELOG_ACTIONS

- 1
- 2

- 3

id	sequence	sql	sent	author	filename
01:jw64d0c4e5f6a.		0	CREATE TABLE "A"...	ev.n	(SMOTY-Generated)
70:00:10f7b0c76a.		0	CREATE TABLE "T"...	ev.n	(SMOTY-Generated)
02:jw64d0c4e5f6a.			-e8qeeel	-e8qeeel	(SMOTY-Generated)

Emp Id	First_name	Last_name	DeptId	Salary
100	Alan	Bell	10	4000
101	Ben	Pollock	10	3500
102	Chris	Ryan	12	4250

Moved to production on Monday

- 901670

- Brian

- Max

- '12

Liquibase and SQLcl

DATABASECHANGELOG_DETAILS is a view that consolidates information from the DATABASECHANGELOG and DATABASECHANGELOG_ACTIONS tables.

DATABASECHANGELOG_ACTIONS

id	sequence	sql	sent	author	filename	
1	ttj.indelodod-addd...	0	CREATE TABLE "A..."	[null]	(SMART)-Generated	may2Tt3, table.xml
2	YNXF01M7X6C9I4...	0	CREATE TABLE "T..."	[null]	(SMART)-Generated	empty_table.xml
3	ttj.indelodod-addd...	-	-Request	-Request	(SMART)-Generated	may2Tt3, table.xml
4	S&PHK15S3W8T4...	ALTER TABLE "EMP" ADD ("MGR" VARCHA	-Client version=" 13...	(SMART)-Generated	emps_table.xml	

id	sequence	sql	sent	author	filename

R(100))

ANALYSIS:

ALTER TABLE "EMP" ADD ("MGR" VARCHAR(100)) COLLATE "USING_NLS_COMP"

Emp Id

First_name Last_name DeptId Salary MGR

100	**Alan**	**Bell**	**10**	**4000**	**200**
101	Ben	Pollock	10	3500	200
102	Chris	Ryan	12	4250	300

Add MGR col to PROD using emps_table.xml

Página 29

SQLcl and Liquibase: APEX

SQL> lb genobject -type apex -applicationid 101

Creates a single f101.xml file for your application

SQL> lb genobject -type apex -applicationid 101 -split

Creates multiple folders/files per component and an install file (like with the database)

NOTE: Liquibase will only update the new/altered files when exporting so that your repository only reflects the changes.

Important flags for change management:

- skipExportDate -expOriginalIds -split
  SQL> lb update -changelog f101.xml
  To install the single file
  SQL> lb update -changelog controller.xml
  To install multiple files
  Create a single file

Página 30

SQLcl and Liquibase: APEX

SQL> lb genobject -type apex -applicationid 101

Creates a single f101.xml file for your application

SQL> lb genobject -type apex -applicationid 101 -split

Creates multiple folders/files per component and an install file (like with the database)

NOTE: Liquibase will only update the new/altered files when exporting so that your repository only reflects the changes.

Important flags for change management:

- skipExportDate -exportiginalIds -split
  SQL> lb update -changeLog f101.xml
  To install the single file
  SQL> lb update -changeLog controller.xml
  To install multiple files

SQLcl and Liquibase: APEX

SQL> lb genobject -type apex -applicationid 101
Creates a single f101.xml file for your application
SQL> lb genobject -type apex -applicationid 101 -split
Creates multiple folders/files per component and an install file (like with the database)
NOTE: Liquibase will only update the new/altered files when exporting so that your repository only reflects the changes.
Important flags for change management:
-skipExportDate -exportiginalIds -split
SQL> lb update -changeLog f101.xml
To install the single file
SQL> lb update -changeLog controller.xml
To install multiple files
Without these changes management becomes difficult

SQLcl and Liquibase: APEX

SQL> lb genobject -type apex -applicationid 101
Creates a single f101.xml file for your application
SQL> lb genobject -type apex -applicationid 101 -split
Creates multiple folders/files per component and an install file (like with the database)
NOTE: Liquibase will only update the new/altered files when exporting so that your repository only reflects the changes.
Important flags for change management:

- skipExportDate -exportiginalIds -split
  SQL> lb update -changeLog f101.xml
  To install the single file
  SQL> lb update -changeLog controller.xml
  To install multiple files
  Liquibase can identify:

- What changed and what didn't change

- Push to git repository only those that changed

SQLcl and Liquibase: APEX

SQL> lb genobject -type apex -applicationid 101
Creates a single f101.xml file for your application
SQL> lb genobject -type apex -applicationid 101 -split
Creates multiple folders/files per component and an install file (like with the database)
NOTE: Liquibase will only update the new/altered files when exporting so that your repository only reflects the changes.
Important flags for change management:

- skipExportDate -exportiginalIds -split
  SQL> lb update -changeLog f101.xml
  To install the single file
  SQL> lb update -changeLog controller.xml
  To install multiple files
  Track:

- Accountability

- Following security standards

- Following coding standards

Página 34

SQLcl and Liquibase: APEX

SQL> lb genobject -type apex -applicationid 101
Creates a single f101.xml file for your application
SQL> lb genobject -type apex -applicationid 101 -split
Creates multiple folders/files per component and an install file (like with the database)
NOTE: Liquibase will only update the new/altered files when exporting so that your repository only reflects the changes.

Important flags for change management:	**Pipeline:**
-skipExportDate -exportiginalIds -split	• Get and setup environment
SQL> lb update -changeLog f101.xml	• Apply new database objects
To install the single file	• Install APEX app into the environment
SQL> lb update -changeLog controller.xml	
To install multiple files	

Página 35

SQLcl and Liquibase: Table Data

What about data???
You can pull data using Liquibase
Not meant for huge amount of data

ORDS used to move data
Use data pump for huge amount of data

SQLcl and Liquibase: Table Data

Liquibase export is great for Metadata tables
Table has only few hundred rows
SQL> lb data -object TABLE_NAME,TABLE_NAME...
Exports the data from the indicated table(s)
SQL> lb update -changelog data.xml
Imports the data into the table(s)
Best for Metadata tables
or smaller tables

Terraform and OCI

Terraform and OCI

Terraform can be used to:

- Build OCI infrastructure

- Modify OCI infrastructure

- Version OCI infrastructure

Terraform and OCI

```
resource "oci_database_autonomous_database" "new_autonomous_database" {
#Required
compartment_id = var.compartment_ocid
cpu_core_count = "1"
data_storage_size_in_tbs = "1"
db_name = "TESTDBS(random_string.db_name.result)"
admin_password = random_string.password.result
db_workload = "OLTP"
display_name = "TESTDBS(random_string.db_name.result)"
}
```

Terraform and OCI

OCI CLI and Terraform can be used to create VMs and other OCI resources

Página 41

Terraform and OCI

Autonomous Database:

- Pay for it by the second you use
- Very helpful for testing purpose

Archivo: 7.4_CI_CD for APEX and Oracle DB Developers - Part 2 (Oracle Data Platform Foundations Associate).pdf

Página 1

Sample Environment

What does a sample environment look like for CI/CD with the ADB and OCI?

- Github
    - Code Repository
    - Internet Gateway
    - OCI
        - Virtual Cloud Network
        - Public Subnet
        - OCI DevOps
        - SQLcl
        - Git
        - Terraform
        - Autonomous Database
        - OCI Resources
        - Compute
        - Object Store
        - Load Balancer
        - Network

Alli Lane

ORACLE CLOUD SOLUTION ENGINEER ORACLE

Developers

High-Level Flow

Start of sprint
Developers start on tickets
Developers check in code
Code review with development group & stakeholders
Code approved & merged with main
Sprint ends & version is created
Version is released into DEV, UAT & PROD

Development

- Backend developers environment created

- Developers put multiple code functions

- Developers create PRs for correct cycle

- Code of database created for PR testing

1.3.2 Results

Benchmarking and QoS data

- **Benchmarking**

    - APEX app

- **Commit Code to repository**

- **Version 0 is created in repository**

- **Development Cycle Start**

1.4.1 Results

- **Pipeline comes back clean**

- **Developer branches merged into main**

- **Version Created in Repository**

1.5.1 Results

- **Backend developers environments and launches deleted**

- **Downloaded by the developer**

- **Windows Server**

- **Windows Server**

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Individual Environments and Creation

- Individual environments need:

  - APEX (Apps and workspace)

  - DB Schema(s)

  - Code from the repository (latest) or deployment

- Automate the process with APIs:

  - OCI CLI/PLSQL SDK

  - ORDS and the SQL Endpoint

  - Terraform

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Individual Environments and Creation

- Autonomous Database Clones

- OCI DB VMs

  - Clone a VM DB

  - Create a new DB VM from a backup

- Using OCI ExaCS

  - Sparse cloning

- Using Multitenancy

  - DB-APIs via ORDS

  - Using REST-enabled SQL service

- Reusable Instance

  - Guaranteed restore points/Flashback Database

  - RMAN duplicate/clone

- Data Pump
- Docker/Virtual Machines
- ACFS/gDBClone

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CI Process for Code Pushes

Every code pull request/merge (maybe push) should spawn a CI/CD pipeline.
The pipeline should:

- Clone from an environment with the latest version of main
- Apply the developers branch/merged main into that database
- Run unit tests
- Report back on the status of the pipeline
- Destroy the environment if it is successful/keep it running if not successful
  Start Stage Repo Terraform GO! Check Logs for ORA Errors End

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Pipeline Process

SQLcl applies the database objects
Environment setup and the database map is executed
Terraform creates a clone of a specified database
SQLcl installs the APEX application(s)
SQLcl runs API SQL for URL data
Pipeline comes back clean
Database Clone is deleted
Developer gets authenticated pipeline status
Version Created and ready for release
Via a webhook the server starts its API pipeline
Git Repository is cloned on the servers VM
Iteration script is run
Pipeline looks for ORA errors in logs
Pipeline finds ORA errors
Database connection details are saved
Developer gets authenticated pipeline status, and database covered files
Developer fixes issues and pushes code to repo

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Deployment Targets and Automating the Process

- Pipelines can also be scheduled or started manually

- Choose deployment target with pipelines
  Jenkins creates the artefacts and stores
  Download and apply these artefacts onto the environment

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Deployment Targets and Automating the Process

- Pipelines can also be scheduled or started manually

- Choose deployment target with pipelines
  Automation
  Pull request
  Merge request

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Deployment Targets and Automating the Process

- Pipelines can also be scheduled or started manually

- Choose deployment target with pipelines

- Eliminate surprises by having a logical progression of environments:

  - Dev

  - UAT

  - Production

- Deploy manually

  - Zip up the repo and deploy when you want

- Use ADB/DB clones to practice deployments manually or via pipelines

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Rollback

Pluggable database:

- Rollback the entire database

- Flashback the database

- Restore to a guaranteed restore point

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Rollback

Not using multi-tenancy??? - We got you covered

- Rollback database objects via Liquibase

- Stage last versions of APEX apps from repository

- Install last version APEX app

- Flashback tables to restore date (metadata changes)

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Rollback

Or Roll Forward?

- In some cases, it may be easier/better to fix the issue in production and bring the fix back to the main code line

- Constant testing/automation should help with these incidents
  | Rollback database objects via liquibase | Stage last versions APEX app(s) from repository |
  Install last versions APEX app(s) | Flashback tables to restore data (metadata changes) |