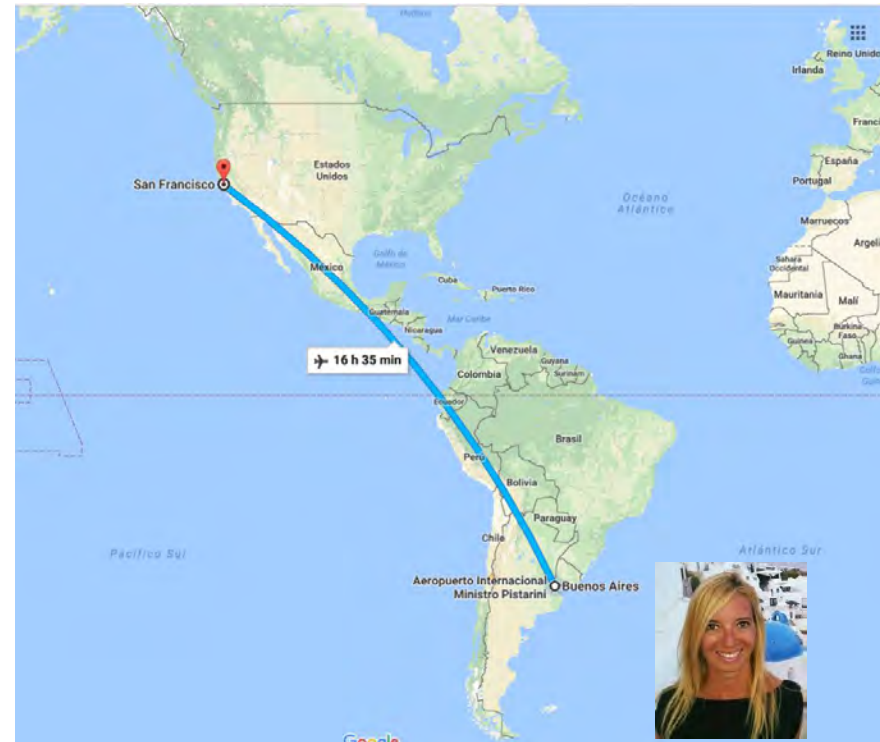


# Managing Oracle Database in Oracle Database Exadata Express Cloud Service

Ing. Rita Nuñez 

- Systems Engineer
- Oracle DBA
- CEO of Tecnix Solutions
- Oracle University Instructor
- Coordinator Database & RAC AROUG
- Speaker in events and write OTN articles, tweets @ritan2000, and my blog <https://dbaoraclesoporte.blogspot.com/>
- Oracle ACE



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✉ [oracle-ace\\_ww@oracle.com](mailto:oracle-ace_ww@oracle.com)

f [Facebook.com/oracleaces](https://www.facebook.com/oracleaces)

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Nominate yourself or someone you know: [acenomination.oracle.com](https://acenomination.oracle.com)

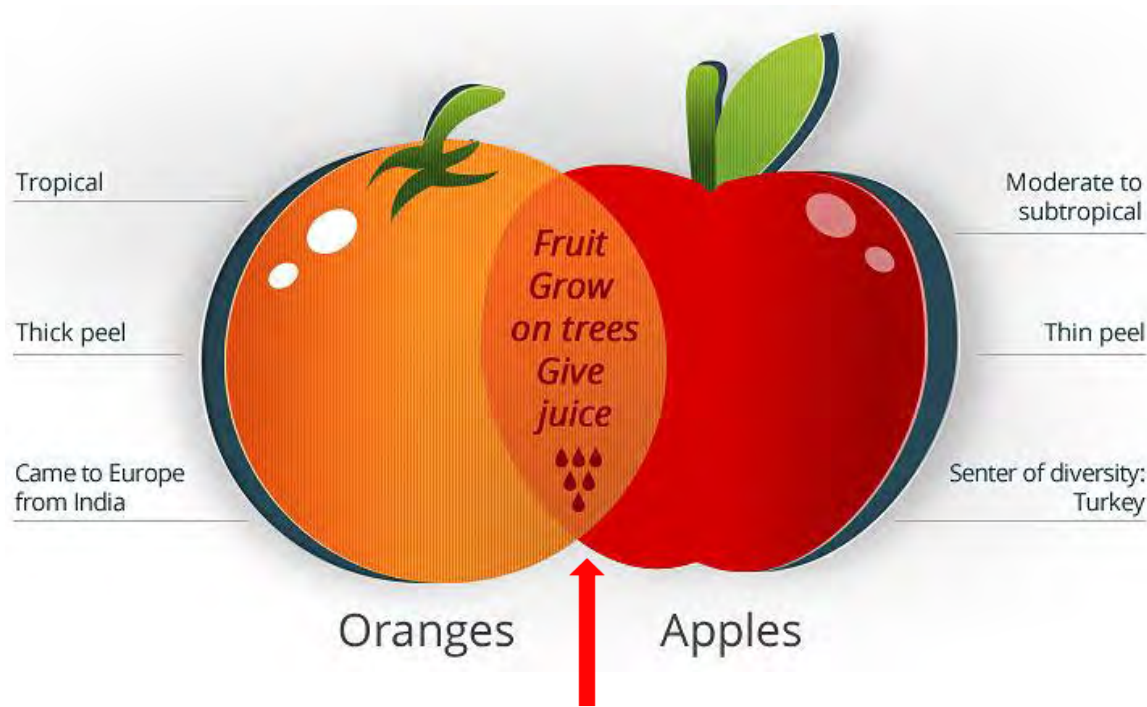
# Oracle Database Exadata Express Cloud Service

Provides a full Oracle Database  
experience for small and medium  
sized databases



# Oracle Database Exadata **Express** Cloud Service Is Different of Oracle Database Exadata Cloud Service

OECS  
Large  
Size and  
Mission  
Critical  
DB



Runs on Exadata

OEECS  
Small  
and  
Medium  
Size DB

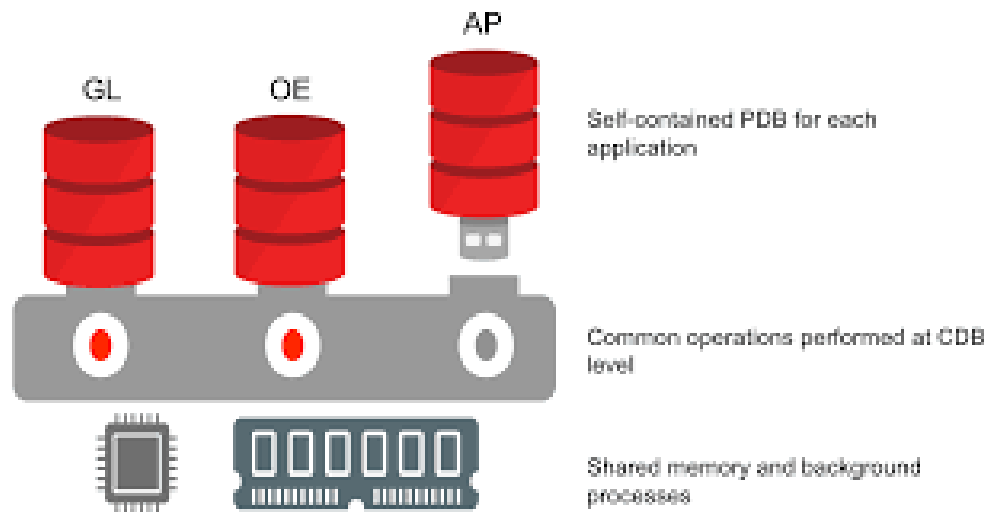
# Oracle Exadata Express Cloud Service

- Database Enterprise Edition 12cR2 with Options
- Oracle Managed Database (network, storage configuration, patching, upgrades, backups, uptime activities and security)
- Customers Admin your Database for Using Advanced Features and Performance Monitoring
- Same software on-premise
- Running on Exadata in Oracle Cloud
- In Memory
- Hybrid Columnar Compression

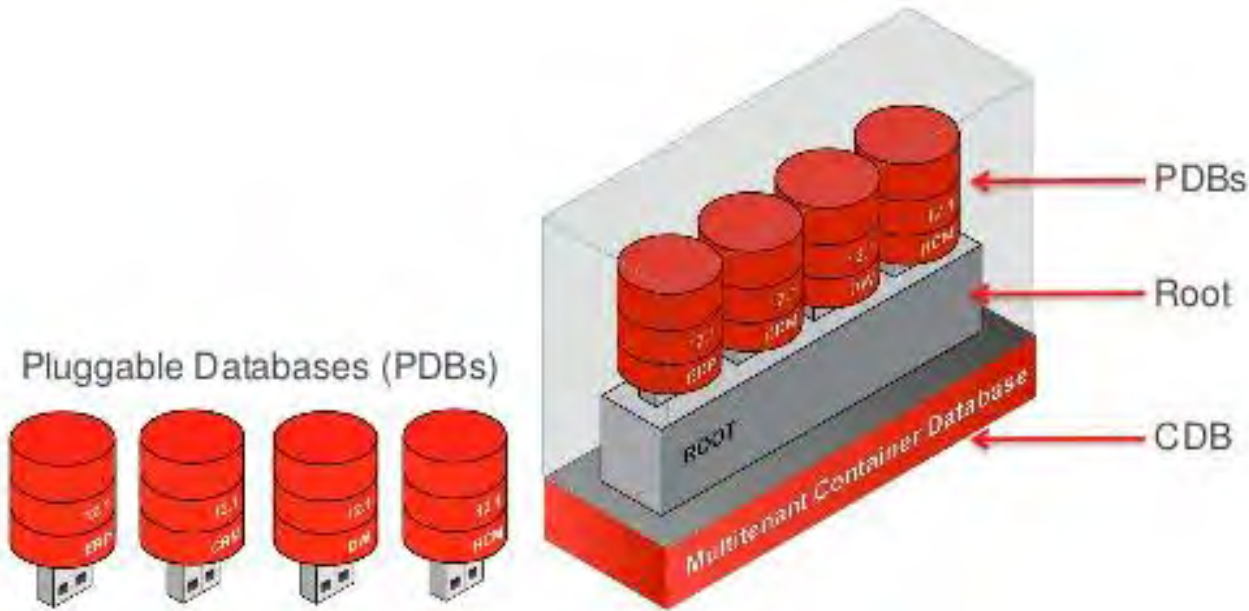


# Oracle Exadata Express Account

Each Exadata Express account provides a managed Pluggable Database (PDB)



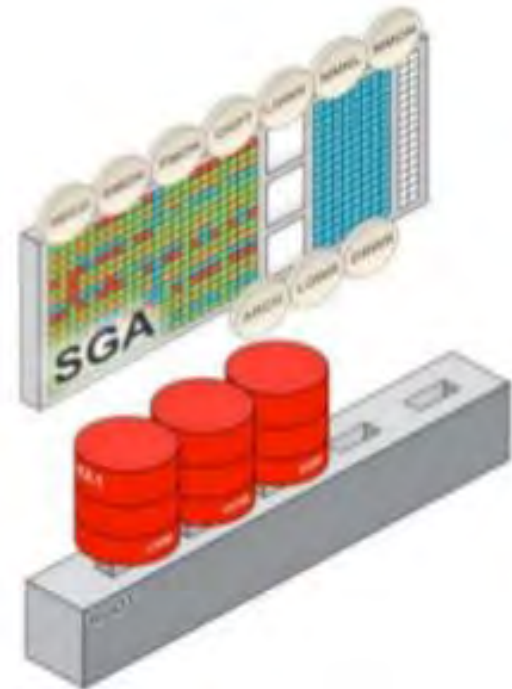
# Multitenant Architecture Review





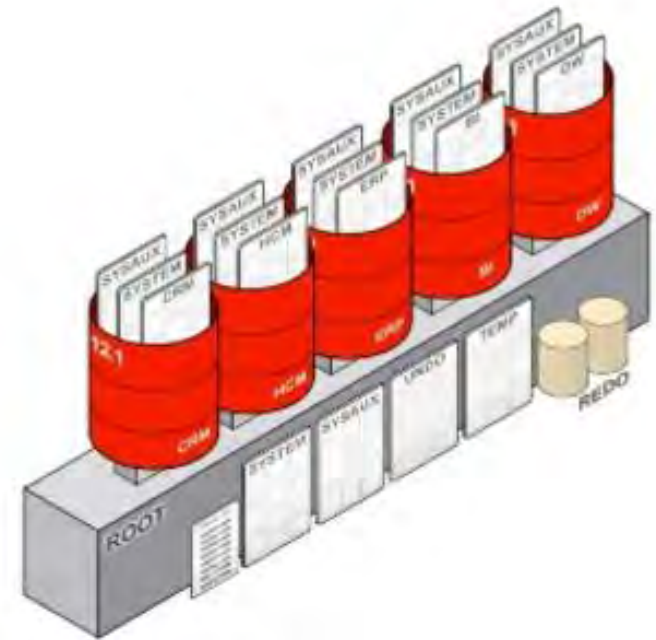
# CDB Instance

- One Instance
  - One Set of Background Process
  - One SGA
- Foreground sessions see only the PDB they connect to



# Multitenant Architecture- Files -

- Each PDB has its own set of tablespaces including SYSTEM and SYSAUX
- PDBs share REDO, UNDO, control files and spfile
- By default the CDB has a single TEMP and PDBS can have their own. In OEECS each PDB has their own TEMP.



# PDBs

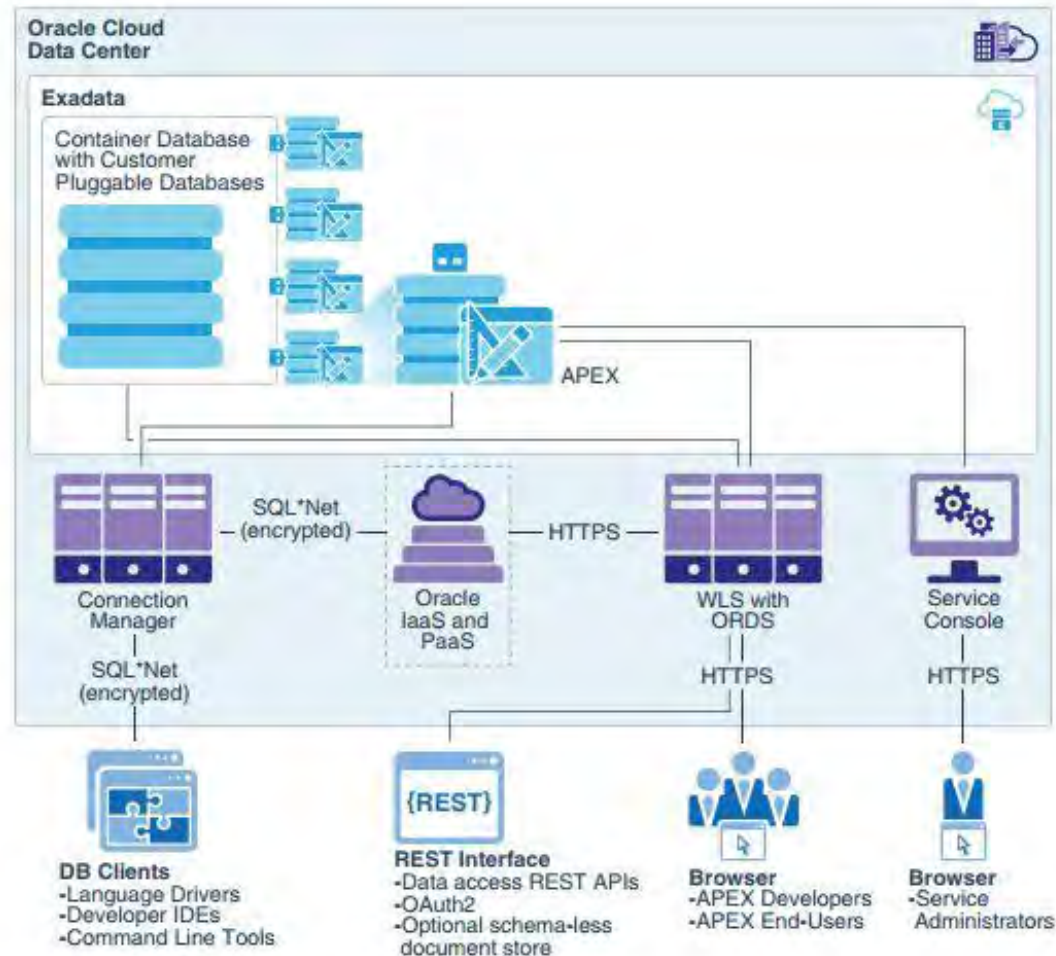
- Isolation between PDBs
- A PDB feels and operate as a Non-CDB



# Oracle Clients

- Oracle Database clients connect to Exadata Express over Oracle Net Services (SQL\*Net)
- SQL\*Net connections are encrypted and mutually authenticated using TLS 1.2
- Oracle Connection Manager (CMAN) cluster running in Oracle Cloud arranges these connections

# Oracle Exadata Express Cloud Service Architecture Overview



# Oracle Exadata Express Service Instance

- Dedicated Oracle Pluggable Database
- One schema
- One user tablespace
- Administrator User : PDB\_ADMIN

# Data Access

- SQL
- Supports RESTful Web Services
- Schema-less documents and collections using the (SODA) API
- Drivers for Java, .NET, Python, Node.js, PHP, C/C++, Ruby



# Integrated Development Environments

- JDeveloper



- SQL Developer



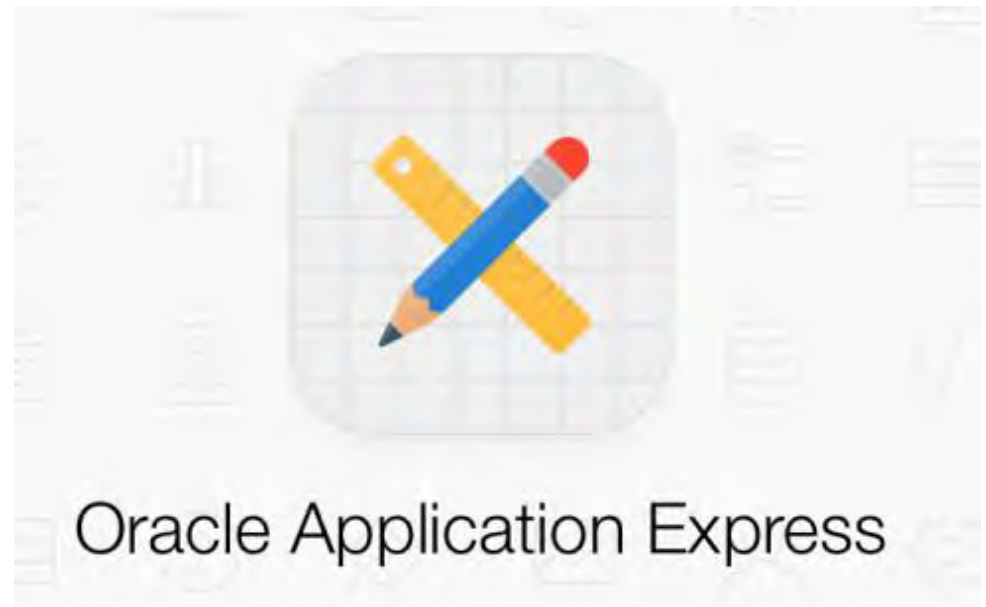
- Data Modeler



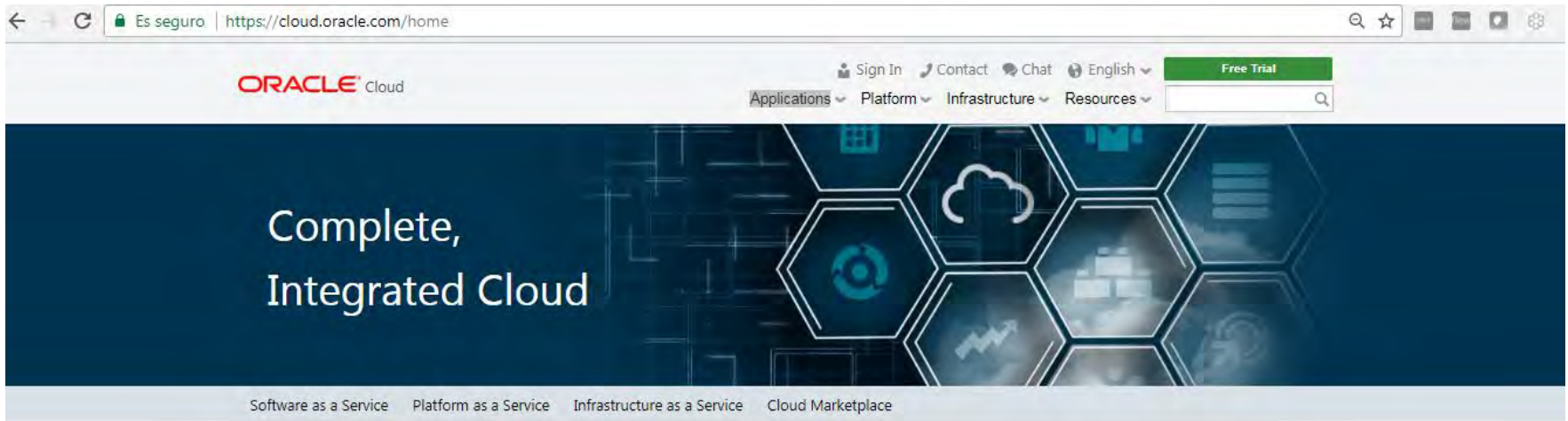


# APEX

- APEX 5.1 Preinstalled
- Built APEX App
- Use Browser
- Pre-built Apps



# How to Begin



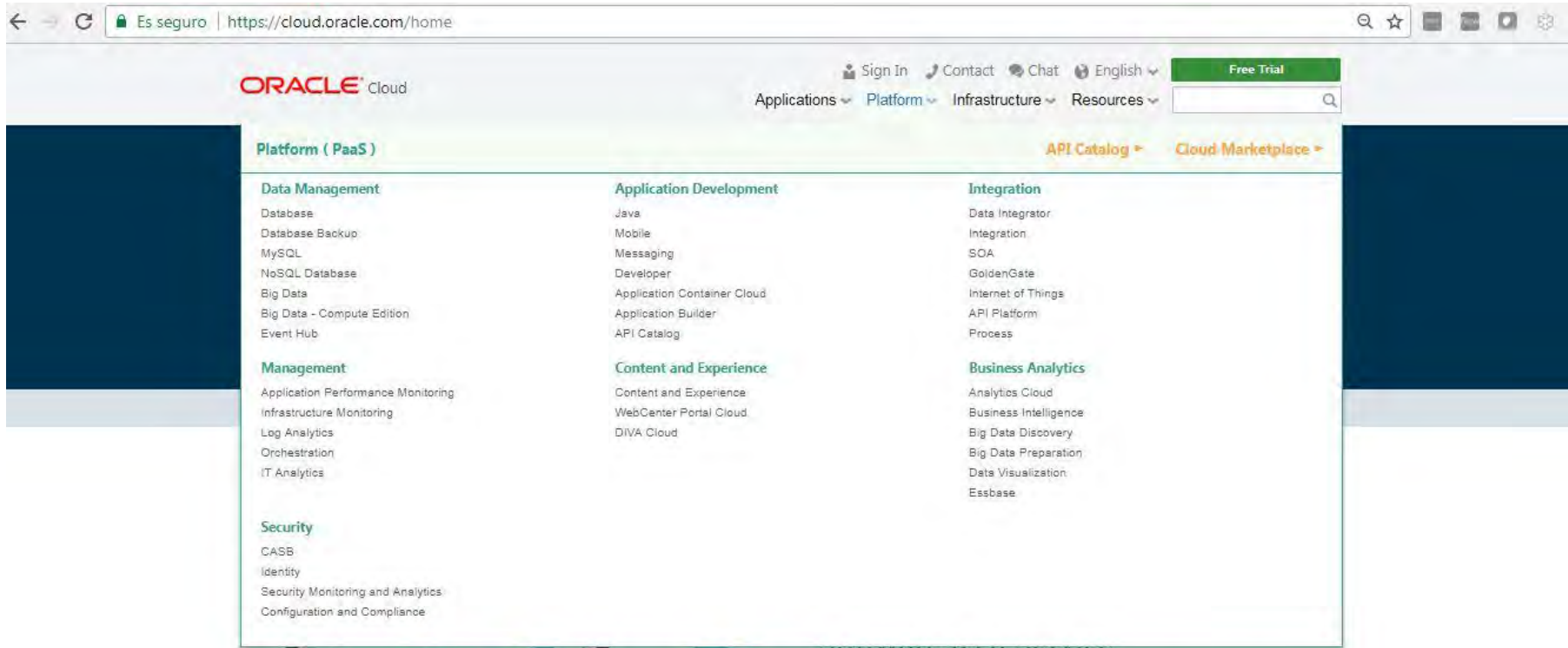
Oracle Cloud is the industry's broadest and most integrated public cloud. It offers best-in-class services across software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS), and even lets you put Oracle Cloud in your own data center. Oracle Cloud helps organizations drive innovation and business transformation by increasing business agility, lowering costs, and reducing IT complexity.



## Software as a Service

Reimagine your business, processes, and experiences. Oracle Cloud Software as a Service (SaaS) applications provide you with the speed and innovation of best-of-breed cloud software in a complete, secure, and connected cloud suite. Embedded with modern, best-practice processes and built-in social, mobile, and analytic capabilities, Oracle Cloud applications help you deliver the experiences your customers

# PaaS -> Database



The screenshot shows the Oracle Cloud website interface. At the top, there is a navigation bar with the Oracle logo, a search bar, and links for Sign In, Contact, Chat, and English. Below the navigation bar, the main content area is titled "Platform (PaaS)" and is divided into several categories:

- Data Management**
  - Database
  - Database Backup
  - MySQL
  - NoSQL Database
  - Big Data
  - Big Data - Compute Edition
  - Event Hub
- Application Development**
  - Java
  - Mobile
  - Messaging
  - Developer
  - Application Container Cloud
  - Application Builder
  - API Catalog
- Integration**
  - Data Integrator
  - Integration
  - SOA
  - GoldenGate
  - Internet of Things
  - API Platform
  - Process
- Management**
  - Application Performance Monitoring
  - Infrastructure Monitoring
  - Log Analytics
  - Orchestration
  - IT Analytics
- Security**
  - CASB
  - Identity
  - Security Monitoring and Analytics
  - Configuration and Compliance
- Content and Experience**
  - Content and Experience
  - WebCenter Portal Cloud
  - DIVA Cloud
- Business Analytics**
  - Analytics Cloud
  - Business Intelligence
  - Big Data Discovery
  - Big Data Preparation
  - Data Visualization
  - Essbase

At the bottom of the screenshot, there is a section titled "Software as a Service" with a background image of a laptop, tablet, and smartphone displaying various applications. Below this image, there is a paragraph of text:

Reimagine your business, processes, and experiences. Oracle Cloud Software as a Service (SaaS) applications provide you with the speed and innovation of best-of-breed cloud software in a complete, secure, and connected cloud suite. Embedded with modern, best-practice processes and built-in social, mobile, and analytic capabilities, Oracle Cloud applications help you deliver the experiences your customers expect, the talent to succeed, and the performance the market.

# Oracle Exadata Express Cloud Service

The screenshot displays the Oracle Cloud website interface. At the top, the Oracle logo is followed by the word "Cloud". Navigation links include "Sign In", "Contact", "Chat", and "English". A "Free Trial" button is visible on the right. Below the navigation, there are dropdown menus for "Applications", "Platform", "Infrastructure", and "Resources". The main content area features a introductory paragraph about Exadata Cloud Service, followed by three service cards: "Oracle Database Exadata Cloud Machine", "Oracle Database Exadata Express Cloud Service - Managed" (which includes a laptop icon), and "Oracle Database Schema Cloud Service - Managed". The footer contains the text "Integrated Cloud Applications & Platform Services" and a row of social media icons.

Es seguro | [https://cloud.oracle.com/en\\_US/database](https://cloud.oracle.com/en_US/database)

**ORACLE** Cloud

Sign In Contact Chat English

Free Trial

Applications Platform Infrastructure Resources

The Exadata Cloud Service brings the full power of Exadata to the Oracle Cloud. The service includes all the benefits of Exadata performance and 100% compatibility with existing business-critical applications and databases that are on premise, ensuring a smooth transition to the cloud.

**+ Oracle Database Exadata Cloud Machine**

Oracle Database Exadata Cloud Machine delivers the world's most advanced database cloud to customers who require their databases to be located on-premises.

**+ Oracle Database Exadata Express Cloud Service - Managed**

Exadata Express provides your own Oracle Database Enterprise Edition running the latest database release on Exadata for a full Oracle experience. It's a fully managed service packed with features for modern application development and great for small to medium sized data.

**+ Oracle Database Schema Cloud Service - Managed**

Schema Service runs Application Express (APEX), giving customers a declarative development environment to rapidly create data-rich web apps.

Integrated Cloud Applications & Platform Services

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Facebook LinkedIn YouTube Twitter Instagram

# Choose the Shape

Es seguro | [https://shop.oracle.com/apex/f?p=CLOUD:2:::NO:RP:PROD\\_HIER\\_ID,P2\\_RAVELLO\\_TOKEN:128008729001720569064599](https://shop.oracle.com/apex/f?p=CLOUD:2:::NO:RP:PROD_HIER_ID,P2_RAVELLO_TOKEN:128008729001720569064599)

ORACLE Cloud Products [Get started for free](#) [Sign in](#)

[Database Exadata Express Cloud Service](#)

Ordenar por: Nombre (de A a Z)

Seleccionar vista: Vista en cuadrícula

**Palabras clave**

- Database (3)
- Exadata (3)

**Características**

- Non-metered (3)
- X20 (1)
- X50 (1)
- X50IM (1)

Service Shape	Subscription Price / Mes
Oracle Database Exadata Express Cloud Service X50IM - Non-metered	ARS14,258.00
Oracle Database Exadata Express Cloud Service X20 - Non-metered	ARS2,626.00
Oracle Database Exadata Express Cloud Service X50 - Non-metered	ARS11,256.00

# Dashboard

ORACLE CLOUD My Services a484961 rita.nunez@tecnixsolutions.com

Dashboard Users Notifications

## Dashboard

Cloud Account a484961 (traditional)

### Welcome

- Create Instance**  
Provision a new service in minutes
- Account Management**  
Administer and manage your account and orders
- Customize Dashboard**  
Fine tune your cloud services overview
- What's New**  
Learn about changes in the latest releases

### Cloud Services

0 Important Notifications

#### Exadata Express

Subscription ID: 576985753 Instances 5

Date	Number of X20 database instances
22	0.12
24	0.11
26	0.10
28	0.08

No data to display

Number of X50 database instances...

No data to display

Number of X50IM database instances...

# Service Instance

The screenshot shows the Oracle Exadata Express interface for a service instance named 'demo4'. The top navigation bar includes the Oracle logo, the text 'Exadata Express', and user information: 'a484961 Help rita.nunez@tecnixsolutions.com'. A left sidebar contains navigation links for 'Home', 'Develop', and 'Manage'. The main content area features a 'Home' header and a dashboard with several key metrics and action cards.

**Service Instance: demo4**

**Home**

Client Access Enabled	Database Version 12.2	APEX Version 5.1.2.00.09	Storage Usage 6.33 GB / 20 GB
--------------------------	--------------------------	-----------------------------	----------------------------------

The dashboard includes three main action cards:

- Welcome Tour**: Take a quick video tour of Exadata Express. See how to connect database clients, load data, and develop apps in minutes.
- Develop**: Download developer tools and rapidly create apps with your favorite programming language or using Application Express (APEX).
- Manage**: Perform management tasks for your cloud database such as setting the admin password, creating schemas, exporting data and more.

At the bottom, there is a language selection menu: Deutsch, English, Español, Français, Italiano, Português (Brasil), 中文 (繁體), 中文 (简体), 日本語, 한국어.

# Database Client Prerequisites

1. Enable Oracle Net Services (SQL\*Net)
2. Download Credentials
3. Follow Set-Up Instructions for the Specific Database Client

SQL\*Plus

SQLcl

SQL Developer

Microsoft .NET y Visual Studio

JDBC Thin Driver y UCP

Node.js









# Enable Client Access

ORACLE Exadata Express a484961 Help rita.nunez@tecnixsolutions.com

Service Instance: **demo4**

## Manage



### Database Management

 <b>Admin Password</b> Set your database administrator password	 <b>Database Schema</b> Create a new schema for database objects
 <b>Client Access</b> Provide access to your cloud database from client tools <span style="float: right; background-color: green; color: white; padding: 2px;">Enabled</span>	 <b>Client Credentials</b> Download a zip file containing client security credentials and network configuration settings
 <b>Document Store</b> Create a document store for schema-less application development with JSON storage and access	 <b>Export to Cloud Storage</b> Export database schemas to an Oracle Storage Cloud Service container

### Getting Started

- [How to set Admin Password](#)
- [How to Enable Client Access](#)
- [How to Download Client Credentials](#)

### Application Express

 <b>Instance Administration</b> Access and perform administration tasks for your APEX instance	 <b>Schema Associations</b> Manage which schemas can be accessed from Application Express
--	---

# Create Database Schema

## Create Database Schema ✕

*i* Schemas store database objects such as tables and indexes. Your database objects and data can be accessed via SQL, and, optionally, from Application Express (APEX) and a REST interface.

Schema \* *?*  
Test01

Password \*  
\*\*\*\*\*

Confirm Password \*  
\*\*\*\*\*

Allow access from APEX *?*  Enable Oracle REST Data Services *?*

Create a new dedicated tablespace *?*

New Tablespace *?*  
Test01\_data

Cancel Create Database Schema

# Document Store Architecture



# Create Document Store

## Create Document Store ✕

*i* The Oracle Database document store keeps documents in collection objects, and like other objects, these collections are grouped into schemas. Functionality such as REST enablement and space management is performed at the schema level. Note that a single Oracle Database can manage multiple document schemas.

New Schema  Existing Schema

TEST01 ▾

Enable SODA for REST *i*

Ready to Use!



# Uses Cases : Development and Testing

- Ideal for APEX and JAVA Developers



# Uses Cases : Production

- Production environment that needs small or medium database



# Uses Cases : DBAs

- DBA : Testing Features as Compression, TDE, Database IM, Data Redaction, Data Mining SQL



PDB





# PDB\_ADMIN

- Is locked by default
- Set Password
- Multitenant Container Database is full Managed by Oracle
- PDB can be Managed by Customer DBA for Executing Performance Tasks and Testing Features

# Tools for Admin

- SQL\*Plus
- SQLcl
- SQL Developer



# SQL Developer Connect as PDB\_ADMIN



# SQL Developer - DBA View - Tablespaces

The screenshot displays the Oracle SQL Developer interface. The title bar reads "Oracle SQL Developer : TABLESPACE PDB\_ADMIN.null@Exadata Express Demo4". The menu bar includes "File", "Edit", "View", "Navigate", "Run", "Team", "Tools", "Window", and "Help". The left-hand pane shows a tree view under "DBA" with categories like "Connections", "Storage", and "Tablespaces". The main window shows the "Tablespaces" view with a table of data.

	TABLESPACE_NAME	MEGS_ALLOC	MEGS_FREE	MEGS_USED	PCT_FREE	PCT_USED	MAX
1	<a href="#">SYSEXT</a>	10	9	1	90	10	32768
2	<a href="#">QFWPLMCPPOO_DATA</a>	10	2	8	21	79	33554432
3	<a href="#">TEST01_DATA</a>	10	4	6	39	61	33554432
4	<a href="#">TEMP</a>	37	37	0	100	0	32768
5	<a href="#">APEX_FILES</a>	100	99	1	99	1	2048
6	<a href="#">DBCLOUD</a>	100	99	1	99	1	2048
7	<a href="#">SYSTEM</a>	400	9	391	2	98	32767
8	<a href="#">SYSAUX</a>	520	29	492	5	95	32767
9	<a href="#">APEXS0</a>	800	104	696	13	87	2048
10	<a href="#">APEXS1</a>	900	81	819	9	91	2048
11	<a href="#">UNDO_2</a>	1805	1803	2	100	0	32767
12	<a href="#">UNDOTBS1</a>	1805	906	898	50	50	32767

# Managing PDB Performance

## Administering Partitioning

Add, Drop, Coalesce, Split, Merge, Exchange, Move, Rename



# SQL Developer – Manage Partitions

The screenshot displays the Oracle SQL Developer interface. The left-hand pane shows the 'Connections' tree with 'Exadata Express Demo4' selected. The main workspace is titled 'Worksheet' and contains the following SQL code:

```
CREATE TABLE test01.system_part_tab1 (number1 integer, number2 integer)
PARTITION BY SYSTEM
( PARTITION p1,
  PARTITION p2,
  PARTITION p3,
  PARTITION p_last);

ALTER TABLE test01.system_part_tab1 ADD
PARTITION p4,
PARTITION p5,
PARTITION p6
BEFORE PARTITION p_last;

alter table test01.system_part_tab1
drop partition p5;
```

Below the code editor, the 'Script Output' window shows the execution results:

```
Task completed in 0.775 seconds

Table TEST01.SYSTEM_PART_TAB1 created.

Table TEST01.SYSTEM_PART_TAB1 altered.
```

The status bar at the bottom indicates 'Line 1 Column 1 | Insert | Modified | Windows C'

# Monitoring Database Performance

- Cloud Portal
  - Resource Quotas
  - Business Metrics
- SQL Developer
  - Real Time SQL Monitor
  - ASH Report Writer
  - Database Status and Instance Viewer
  - SQL Tuning Advisor
- SQL\*Plus and SQLcl

# SQL Developer – Real Time Monitor

The screenshot displays the Oracle SQL Developer interface with the Real Time SQL Monitor window open. The window title is "Real Time SQL Monitor" and it shows a table of active SQL statements. The table has the following columns: Status, Duration, Type, SQL Id, Plan Hash, User, Parallel, Database Time, I/O Requests, I/O Bytes, Buffer Gets, and Start Time. The first row shows a successful query with a duration of 8 seconds and various performance metrics.

Status	Duration	Type	SQL Id	Plan Hash	User	Parallel	Database Time	I/O Requests	I/O Bytes	Buffer Gets	Start Time
✓	8 s	SQL	a03sh2u00nnn1	2739154978	PDB_A...		7.8 s	8K	85.7MB	84.4K	27-Sep-2017 21:42:54

Below the table, the Messages - Log window shows a message: "Exadata Express Demo4~2\*: Sep 27, 2017 6:43:55 PM: Commit successful".



# SQL Developer – SQL Tuning Advisor

Oracle SQL Developer : Exadata Express Demo4~2

File Edit View Navigate Run Source Team Tools Window Help

DBA

Connections

Exadata Express Demo4

Database Configuration

Database Status

Instance Viewer

Status

Data Pump

Performance

RMAN Backup/Recovery

Resource Manager

SQL Translator Framework

Scheduler

Security

Storage

Archive Logs

Control Files

Datafiles

Redo Log Groups

Rollback Segments

Tablespaces

Temporary Tablespace Groups

Tuning

Real Time SQL Monitor

Worksheet Query Builder

```
select * from test01.table3 union select * from test01.table3 union select * from test01.table2;
```

6.96400023 seconds

Exadata Express Demo4

SQL Tuning Advisor x

6.964 seconds

Implement Type

- Statistics
- SQL Profile
- Indexes
- Restructure SQL

Overview Detail

Tuning Task Name: **staName41841**

Tuning Task Owner: **PDB\_ADMIN**

Workload Type: **SQL Statement**

Scope: **COMPREHENSIVE**

Completion Status: **COMPLETED**

```
select * from test01.table3 union select * from test01.table3 union
```

Findings	Recommendations	Rationale
Optimizer statistics for table "TEST01"."TABLE3" are stale.	Consider collecting optimizer statistics for this table.	The optimizer requires up-to-date statistics for the table in order to select a good execution plan.
An expensive "UNION" operation was found at line ID 1 of the execution plan.	Consider using "UNION ALL" instead of "UNION", if duplicates are allowed or uniqueness is guaranteed.	"UNION" is an expensive and blocking operation because it requires elimination of duplicate rows. "UNION ALL" is a cheaper alternative, assuming that duplicates are allowed or uniqueness is guaranteed.

Messages - Log

Line 1 Column 11 | Insert | Modified | Windows: □

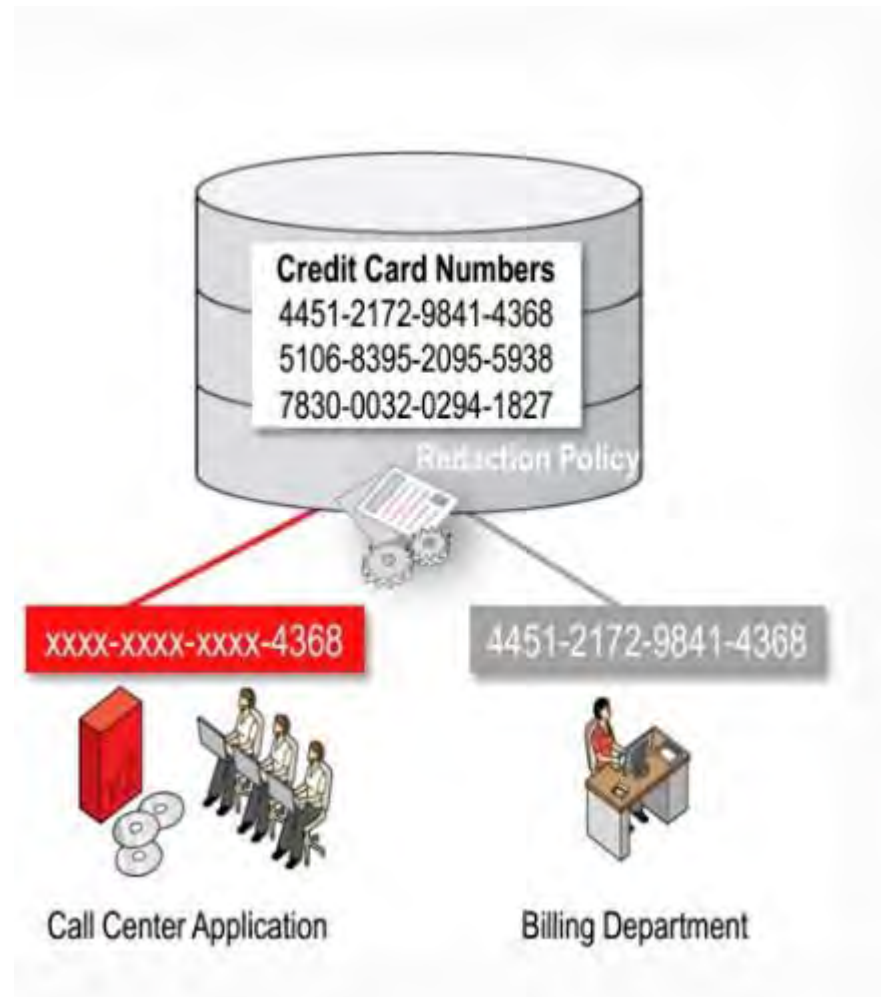
# Managing PDB

Local Users, Roles, Privileges



# Data Redaction

- Mask Data



# Migrating Data

- Migrate Databases On-Premise to Cloud
- Migrate Database from the Cloud to On-Premise



# PDB Restrictions

- Lockdown Profile

- ALTER SYSTEM is disabled except ALTER SYSTEM SET

ALTER SYSTEM KILL SESSION 50946, @2' IMMEDIATE;



- Operating System Access, Common Schemas and AWR access are disabled
- Resource restrictions are controlled by Oracle Resource Manager
- Can't Create DB Links



**Thank you!**

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@ritan2000