20.03.2025

Unlocking the Power of Oracle Autonomous Databases for APEX Developers

Timo Herwix, Senior Consultant

code of change

Hyand by GOD | MT

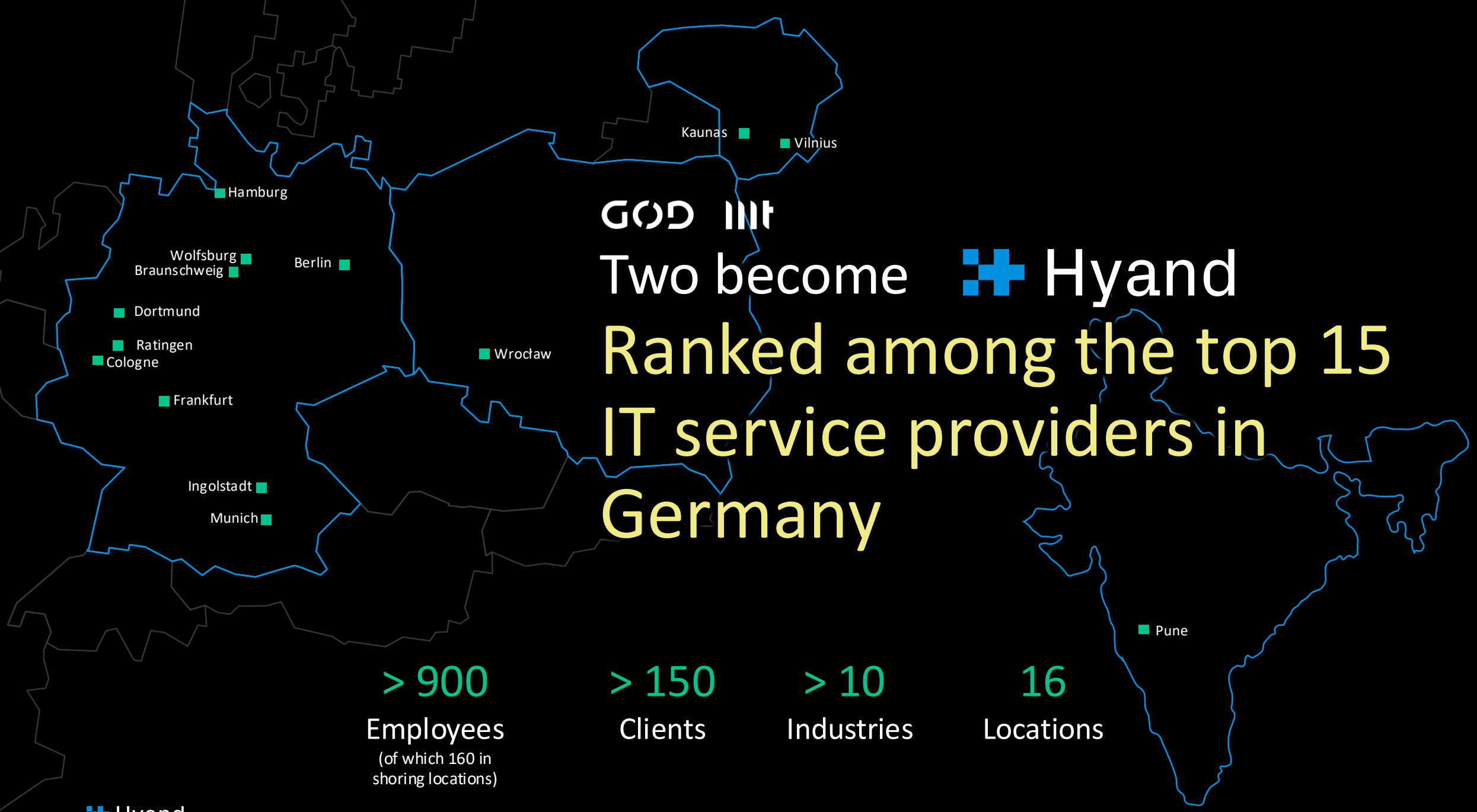
Who am I?

Timo Herwix
Senior Consultant

Oracle ACE Pro

- Senior Consultant at Hyand Solutions GmbH since 2019
- Previously worked as a Data Warehouse Developer
- Oracle APEX since 2016
- Oracle Databases since 2008
- Blog author, conference speaker
- Born in 1983, two children and living in Germany

Hyand



GOD IT

Two become Hyand

Ranked among the top 15 IT service providers in Germany

> 900	> 150	> 10	16
Employees (of which 160 in shoring locations)	Clients	Industries	Locations

Hyand

1

Introduction

2

Let´s dive deeper

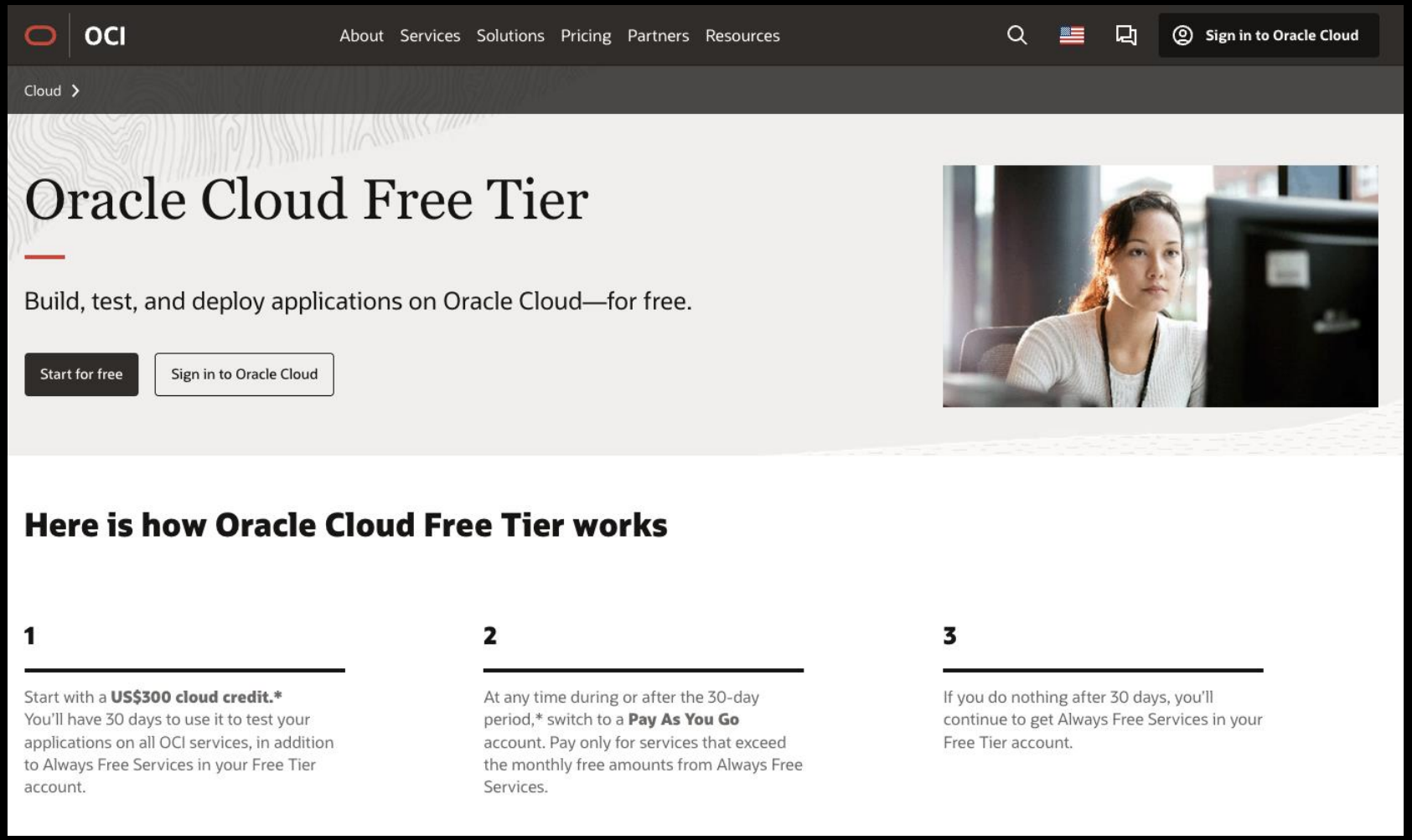
3

Wrap-up

Hyand

Get started with Oracle Cloud Infrastructure!

Get started with Oracle Cloud Infrastructure!



https://www.oracle.com/cloud/free/

Oracle APEX Application Development Service.

Fully managed, mission-critical stack for as low as $122.39/month

- $120.08 for 2 ECPUs and
  $2.31 for 20 GB per month

Automatically scales up and down - supports dozens to millions of users

- Automatically Scales Compute and Storage
- Supports hundreds of thousands of page views per hour

- Lower costs
- Pay-per-use subscription model
- All-inclusive pricing—no per application, per user fees
- The free version you can use for an unlimited time

Cloud Capabilities.

	Always Free	APEX Application Development Service	APEX with Autonomous Database
APEX	All Oracle APEX capabilities are available across all services. Learn more.		
Management	Fully managed Oracle Autonomous Database and Oracle APEX with automated patches and upgrades.		
Limits on apps, users, or developers	No limits on number of APEX apps, end-users, or developers.		
Elastic Compute & Storage	-	✓	✓
Auto Scale	-	✓	✓
Automatic Backups	-	✓	✓
Auto-failover to standby	-	-	✓
Direct Database Connectivity[3]	✓	-	✓
Full Instance Cloning	✓	✓	✓
Integrated Multicloud (Azure + OCI)	-	✓	✓
Access to Complementary OCI Services	• Artificial Intelligence (GenAI, chat, vision, speech...) • Analytics and BI • Object Storage • Email Delivery • Integration • Identity • *and 100+ more...*		

Hyand

Always Free Cloud Services.

Autonomous Database

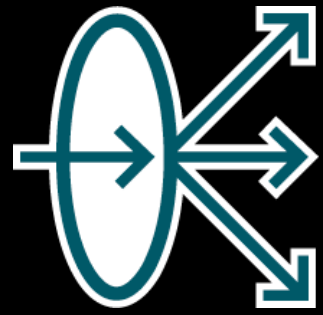
2 Databases
20 GB storage

Compute

2 VMs
1 GB Memory each

Storage

2 x 100 GB Block-Volumes
20 GB Object Storage



Load Balancing / Networking

10 Mbps LB
10 TB Outbound Data Transfer
2 VCNs

Monitoring / Notifications

500 million ingestion
1 billion retrieval
10 GB Logging
1 million Notifications
3000 emails per month

Hyand

1

Introduction

2

Let´s dive deeper

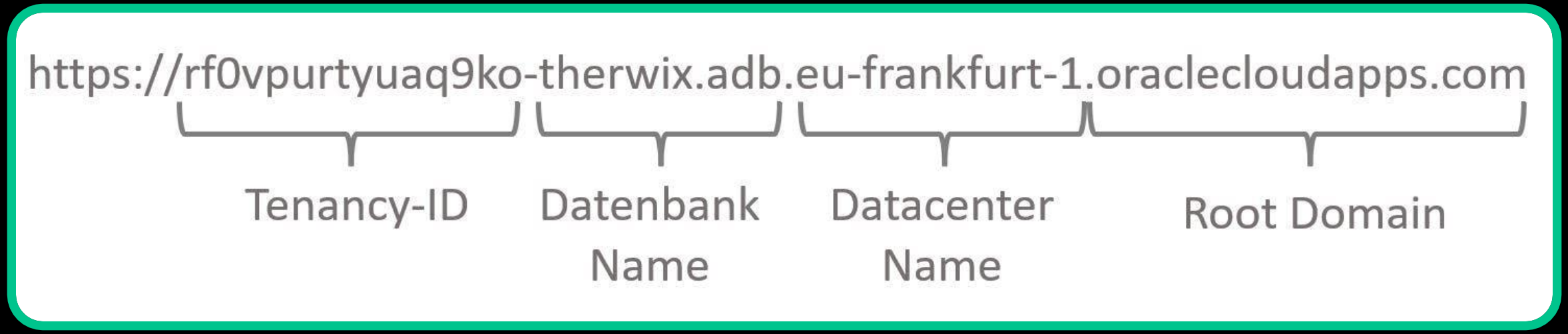
3

Wrap-up

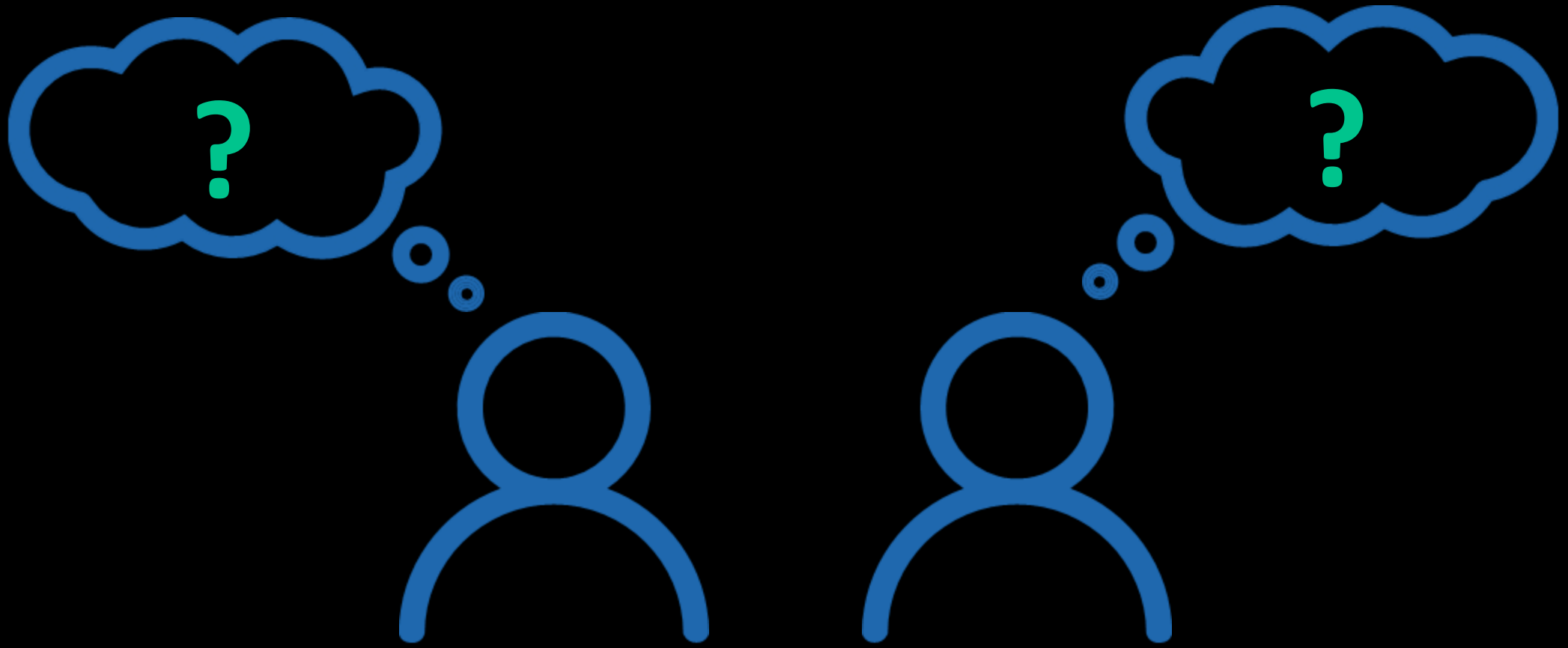
Hyand

The matter with the URL!

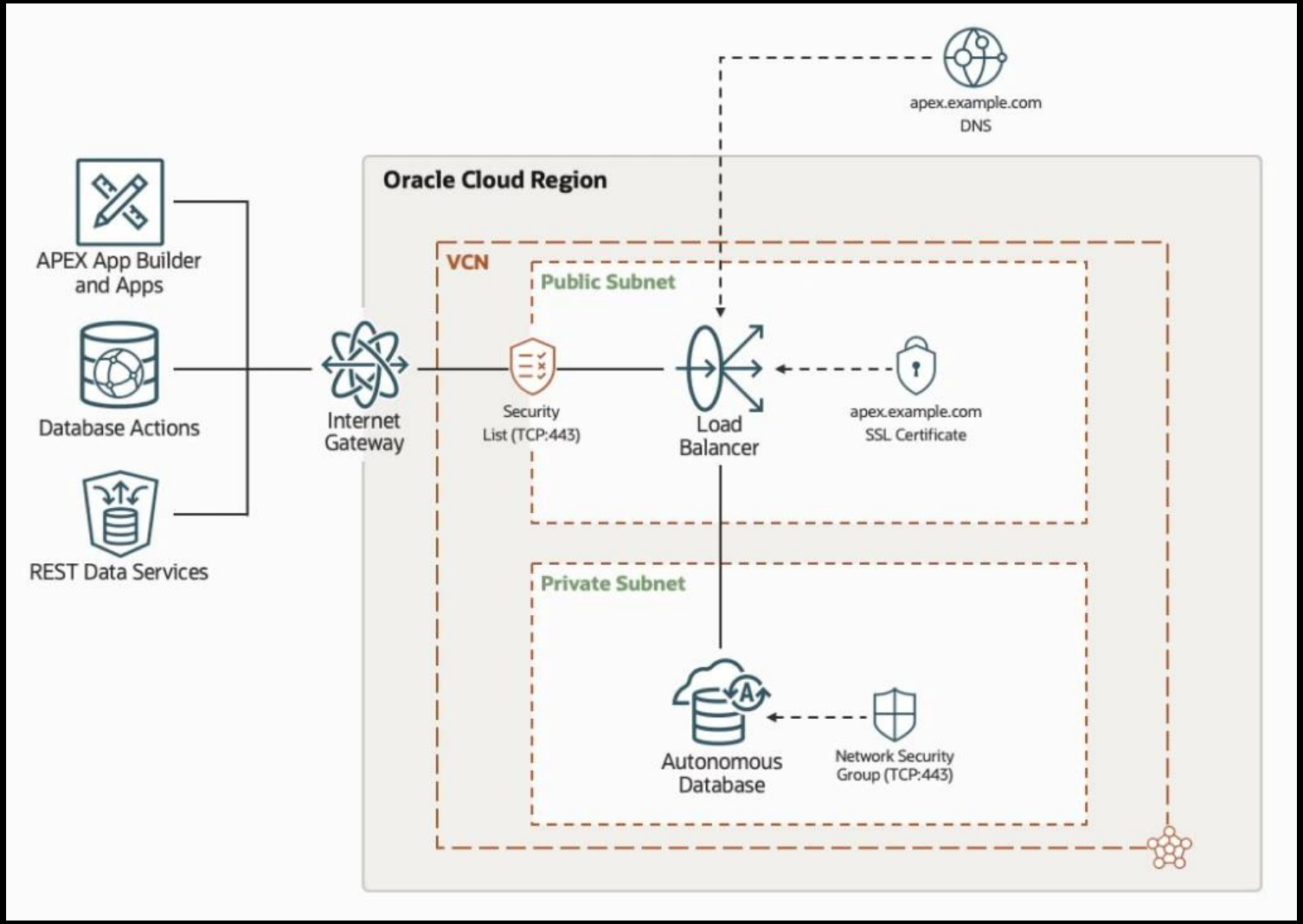
Automatically generated URL by OCI.



WHASUP?!?!?



Boost your brand identity with Vanity URLs via OCI.



Boost your brand identity with Vanity URLs via OCI.

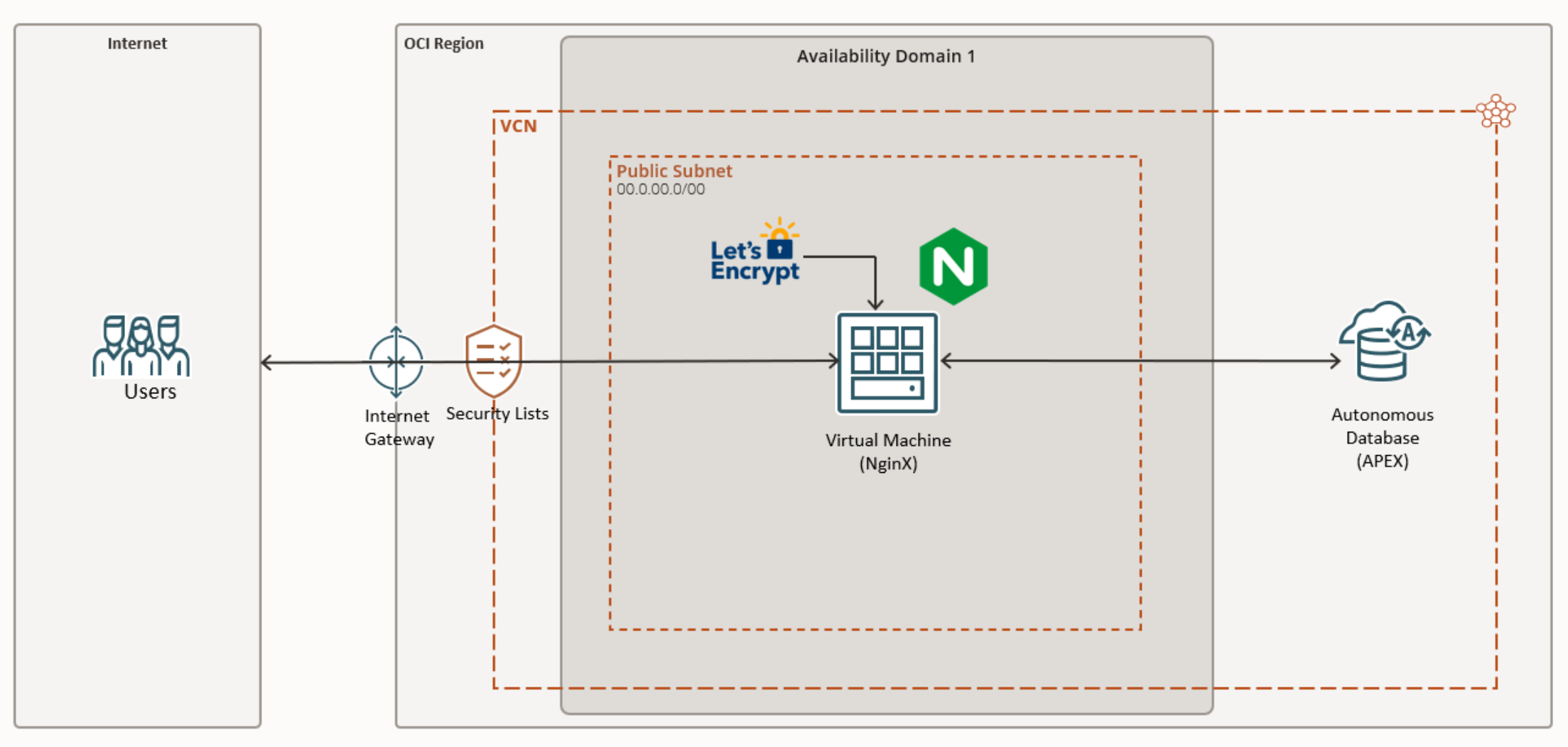
Use only OCI services managed by Oracle

Social sign-in works

Cannot be implemented in a free tier

The renewal of the certificate is not automated

Custom URLs using Nginx and let’s encrypt.



Hyand

Custom URLs using Nginx and let’s encrypt.

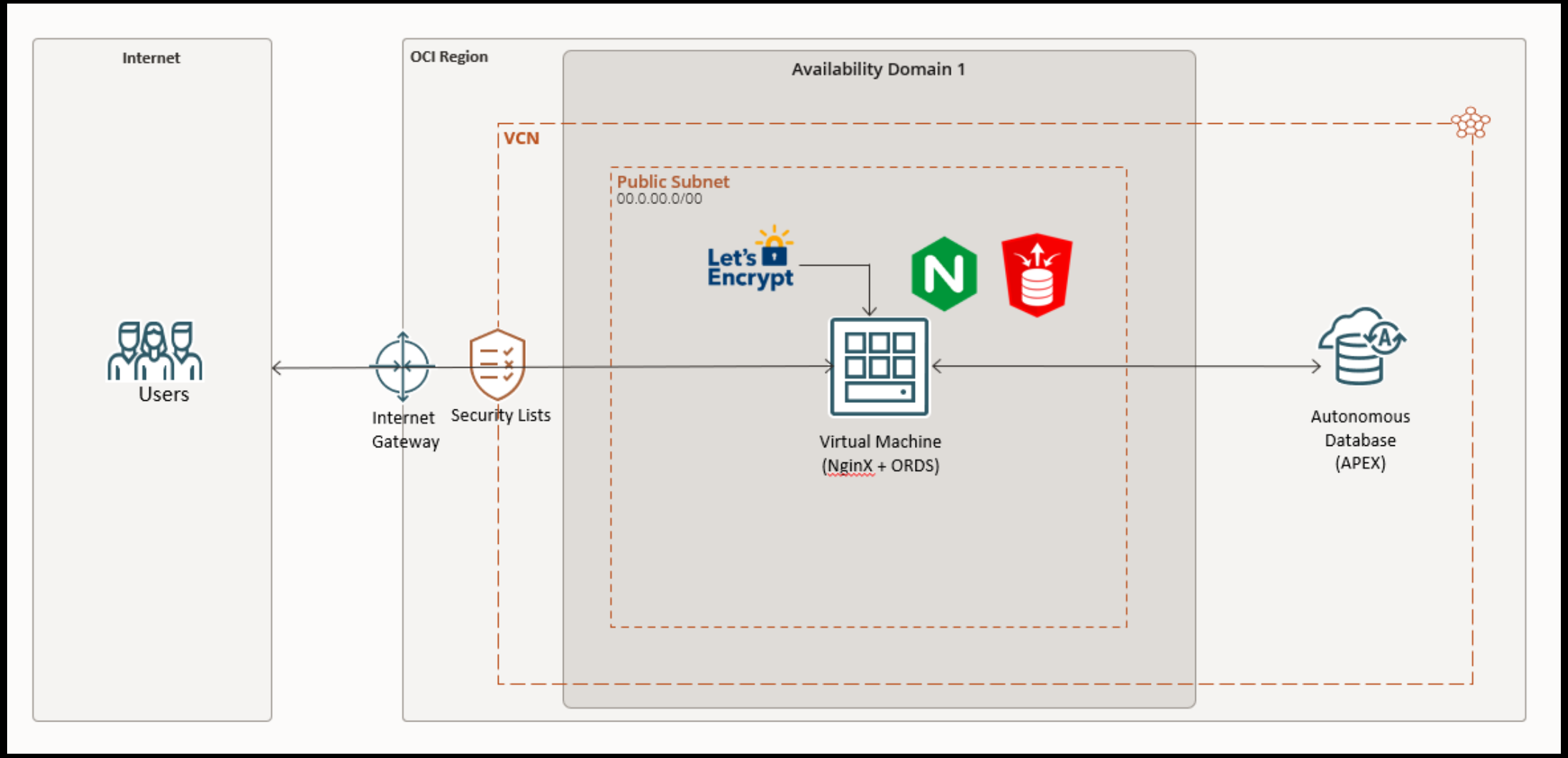
Can be implemented in a free tier

The renewal of the certificate is automated

Use not only OCI services managed by Oracle

Social sign-in didn´t works

Custom URLs using Custom ORDS Server.



Custom URLs using Custom ORDS Server.

Can be implemented in a free tier

The renewal of the certificate is automated

Social sign-in works

Use not only OCI services managed by Oracle

The ephemeral IP address!

Types of public IPs.

Ephemeral IP address

- Only temporary and existing for the lifetime of the instance.

Reserved IP address

- Exists permanently and not for the lifetime of the instance to which it is assigned. You can unassign it and reassign it to another instance whenever you want.

By default, when you provision an instance into a public subnet, the instance gets an ephemeral public IP unless you directly deny it.

What about Security?

Single-Sign On!

Use OCI to access APEX.

Single sign-on for everybody!

- Use the same username/password credentials as OCI
- OCI allows multi-factor authentication

Get the most out of it!

- OCI has inbuilt reports auditing sign-on
- OCI can link to one or more third-party identity providers (e.g. Azure AD etc) without additional code

SAML Sign-In

With the default ORDS on the Autonomous Database, you can't modify any of the ORDS configuration options.

By installing and configuring a Customer-Managed environment for ORDS, we can adjust the ORDS settings, specifically our SAML configuration, to suit our needs.

Cross-Origin Resource Sharing

The SAML authentication flow requires ORDS to allow cross-origin requests from your Identity Provider to Oracle APEX. Typically, ORDS blocks these requests to its PL/SQL gateway, including Oracle APEX. To fix this, configure ORDS to trust your Identity Provider by setting the security.externalSessionTrustedOrigins parameter.

Sign-on policy!

Define your own Sign-on Rules.

The identity providers that will be used to authenticate

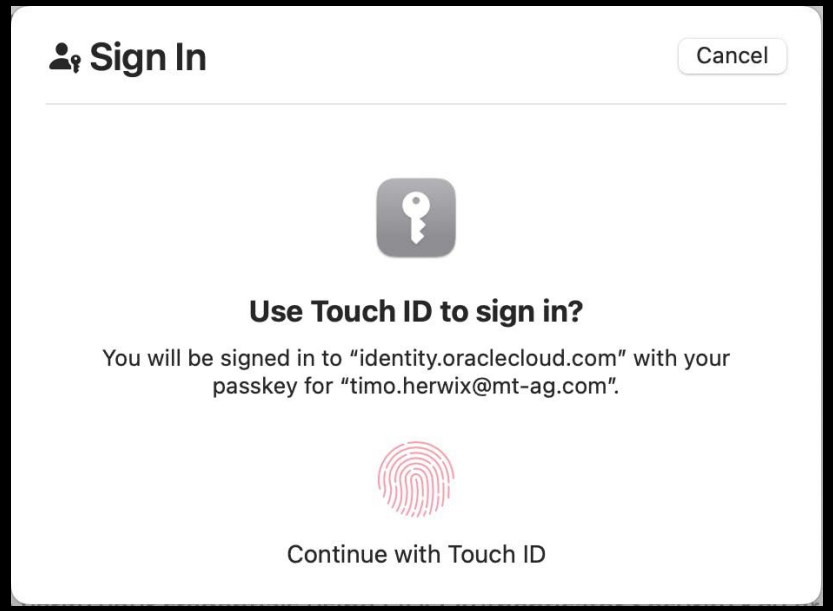
The groups that will be used to authenticate

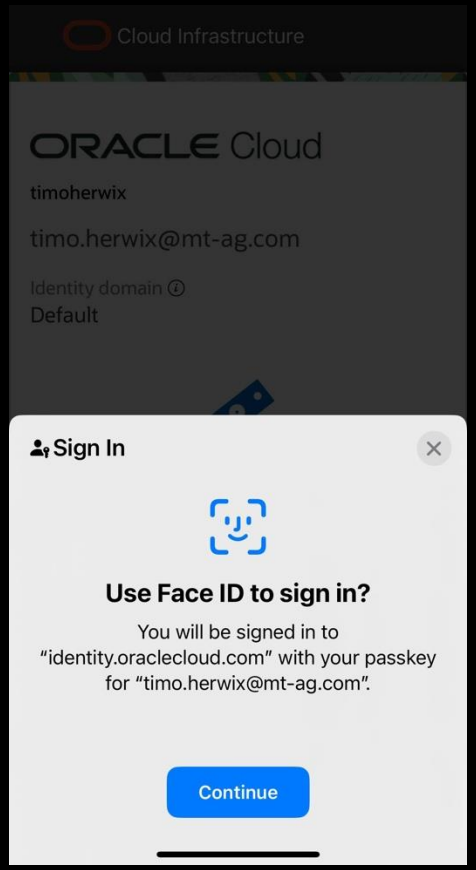
The frequency that will be used to authenticate

Authentication Factors!

- Security Questions: Users verify their identity by answering a set number of questions after entering their username and password.
- Email: OCI sends a one-time passcode to the user's primary email for second verification.
- Duo Security: Enable Duo Security for MFA, allowing users to authenticate via the Duo App or other factors.
- Fast ID Online (FIDO): Configure FIDO authentication for users to utilize external devices like YubiKey or internal devices like Windows Hello or Mac Touch ID for identity domain authentication.
- Mobile App Passcode: Use an authenticator app like Oracle Mobile Authenticator or Google Authenticator for generating OTPs.
- Mobile App Notification: Send a push notification with an approval request for login attempts. After entering credentials, a request is sent to the user's phone app, and they tap Allow to authenticate.
- Text Message (SMS) or Phone Call: Users receive a passcode via text or call for use as a second verification method after entering their username and password.

Passwordless Authentication!





High Security

Password + 2 Factor

Passwordless

Inconvenient

Convenient

Password

Low Security

Hyand

Network-Access-Control!

Specify IP addresses that are allowed to access

Network Perimeter!

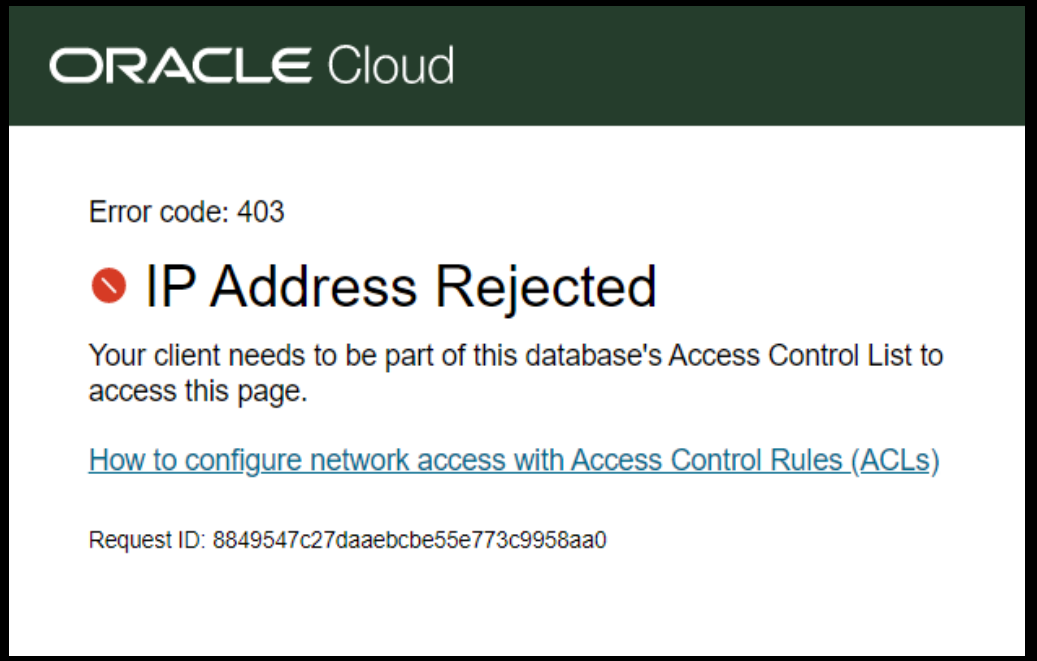
If you or your VPN has a static IP address, you can configure OCI to reject all connections from unknown IP addresses.

Please note that there is a significant risk that you will be logged out if your static IP address changes!!!

Specify IP addresses that are allowed to access

Access Control List!

The network access rules you create for an access control list provide protection for your autonomous database by allowing only the public and VCN IP addresses in the list to connect to the database.



This adds an additional layer of security to your autonomous database.

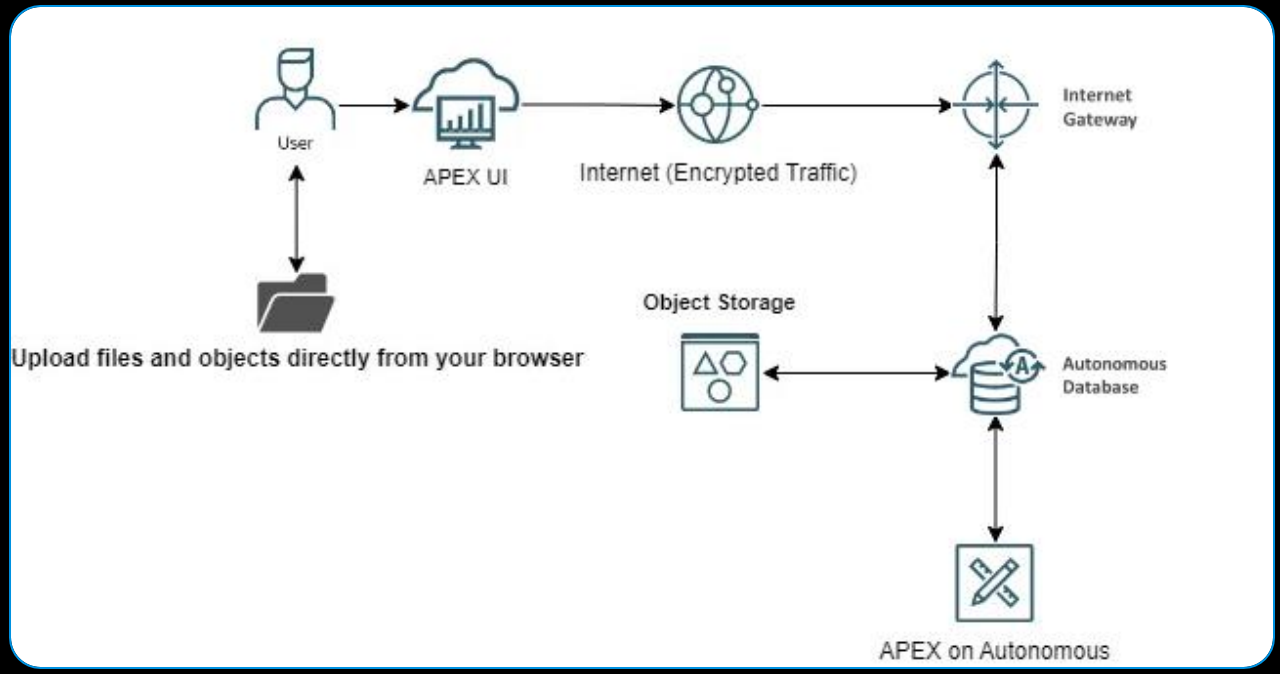
Document-Management!

Hyand

Use OCI Object Storage to store files.

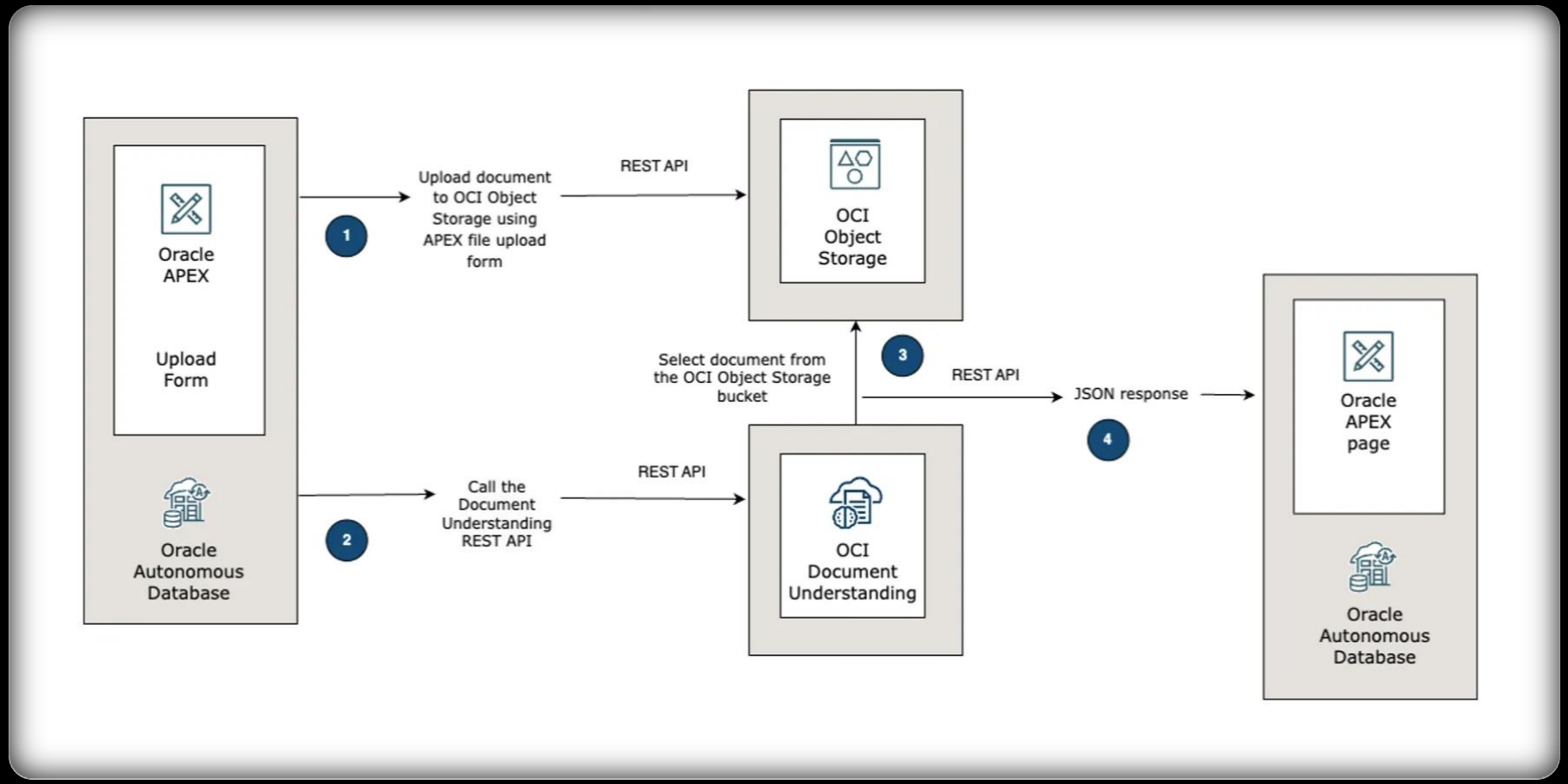
Why to use?

- **Always free databases have only 20 GB storage**
- **With OCI Object Storages you can get 20 GB more**
- **OCI Object Storage are high performance and resistant to hardware failures**
- **Use the DBMS_CLOUD API to GET, PUT and DELETE files in OCI Object Store**
- **Quick and easy to integrate**
- **If you like, enable object versioning**

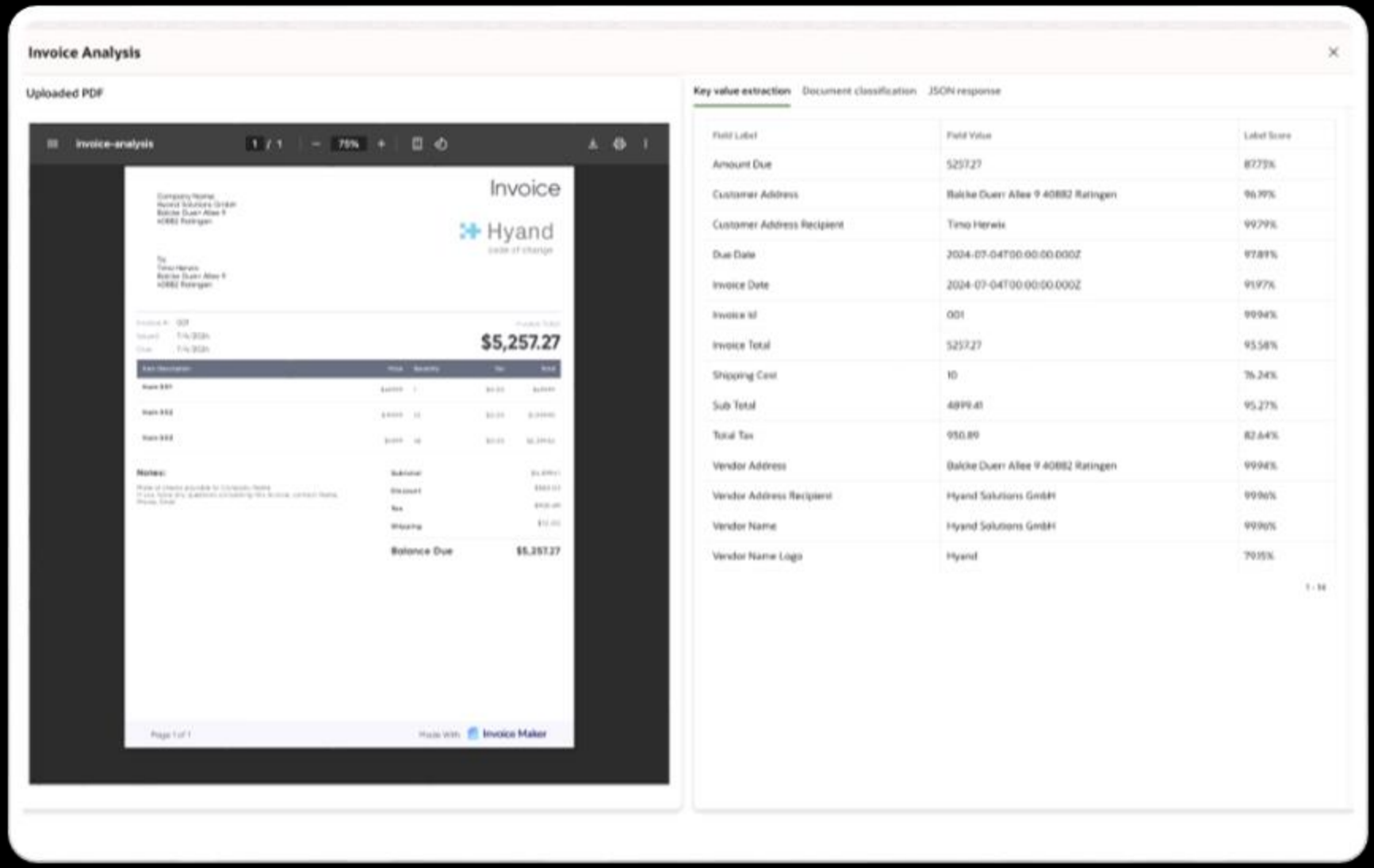


Analyze your documents.

Oracle Document Understanding is an AI-powered service of the Oracle Cloud Infrastructure (OCI) that enables its users to automatically extract information from certain kinds of Documents.



Analyze your documents.

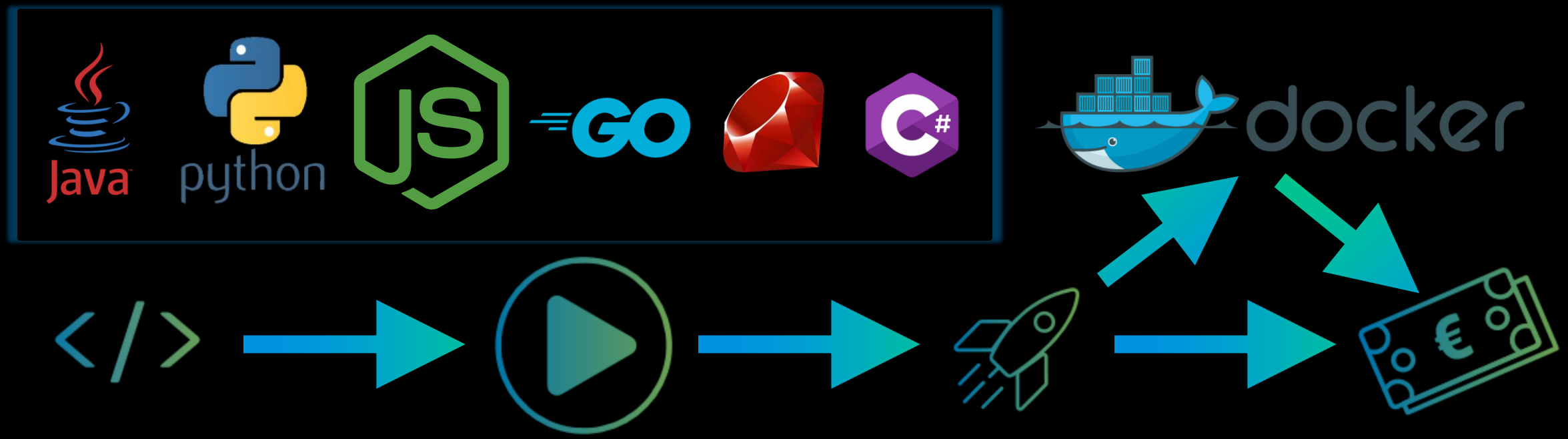


Hyand

OCI Document Generator!

Hyand

Serverless functions.



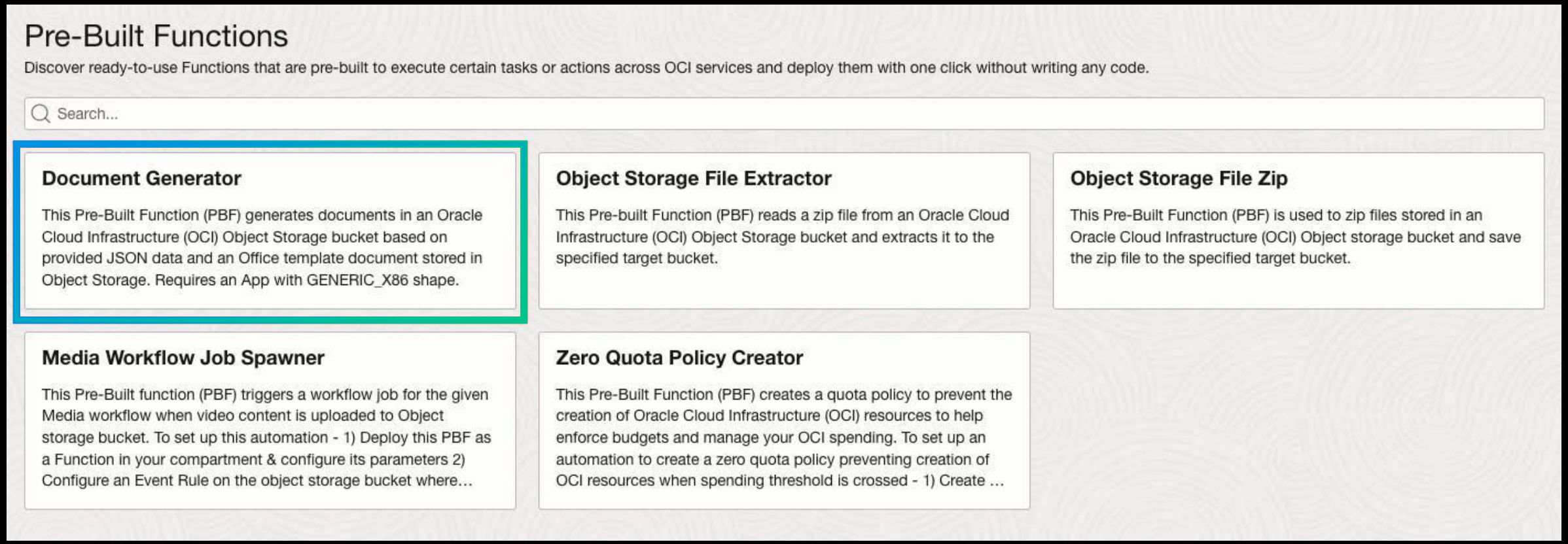
Application/ Function development

Configuring the trigger

Function only executed when triggered

Only the execution time will be paid

Pre-Built functions.



Create function.

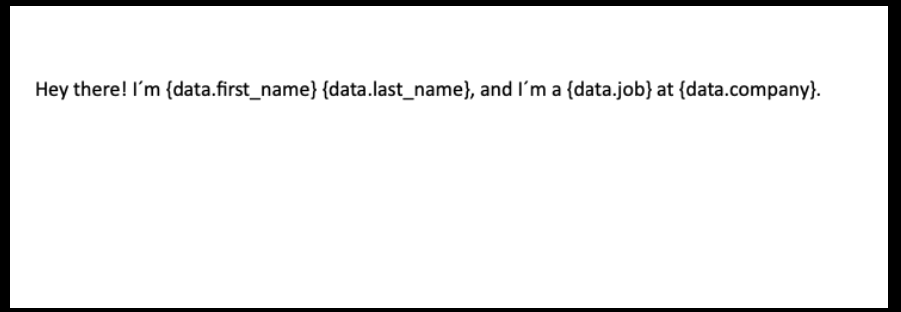
https://<unique-id>.<region>.functions.oci.oraclecloud.com/20181201/functions/<function-id>/actions/invoke

Prerequisites.

JSON data

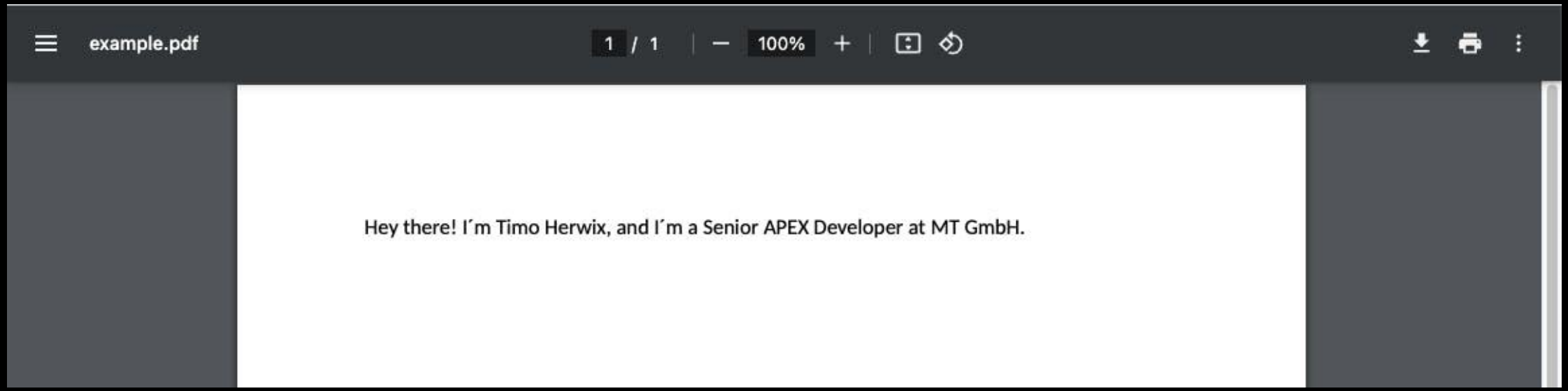
```json
{
  "data": {
    "first_name": "Timo",
    "last_name": "Herwix",
    "job": "Senior APEX Developer",
    "company": "MT GmbH"
  }
}
```

Office Template



Request body template.

```
{
  "requestType": "SINGLE",
  "tagSyntax": "DOCGEN_1_0",
  "data": {
    "source": "OBJECT_STORAGE",
    "namespace": "my_namespace",
    "bucketName": "my_bucket",
    "objectName": "example.json",
    "contentType": "application/json"
  },
  "template": {
    "source": "OBJECT_STORAGE",
    "namespace": "my_namespace",
    "bucketName": "my_bucket",
    "objectName": "example.docx",
    "contentType": "application/vnd.openxmlformats-officedocument.wordprocessingml.document"
  },
  "output": {
    "target": "OBJECT_STORAGE",
    "namespace": "my_namespace",
    "bucketName": "my_bucket",
    "objectName": "example.pdf",
    "contentType": "application/pdf"
  }
}
```


example.pdf
1 / 1
100%
Hey there! I´m Timo Herwix, and I´m a Senior APEX Developer at MT GmbH.

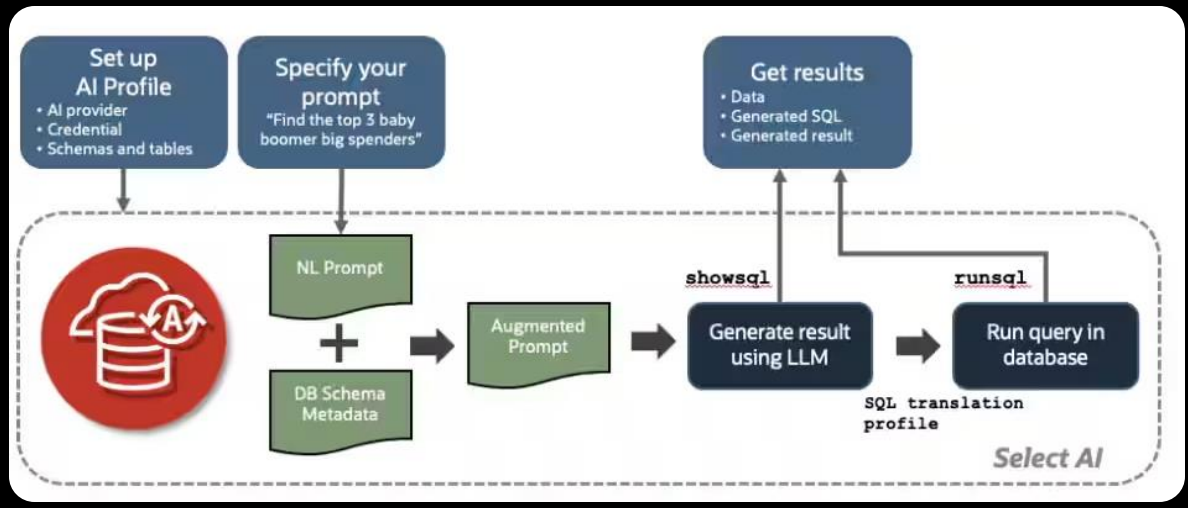
Hyand

Chat with your Database.

Hyand

Chat with your Database.

- **Autonomous Database Select AI makes it easy to interact with important business data using natural language.**
- **Select AI supports the showsql and runsql commands to display and execute the generated SQL.**
- **It also includes narrate and chat commands for a more conversational and interactive experience.**
- **By making natural language queries simpler, Select AI empowers non-technical business users to easily access and analyze data without needing advanced SQL skills.**



Chat with your Database.

```
1  SELECT AI RUNSQL which are the ten articles that were sold most frequently;
```

return the SQL result set

return the generated query

```
1  SELECT AI SHOWSQL which are the ten articles that were sold most frequently;
```

```
1  SELECT AI EXPLAINSQL which are the ten articles that were sold most frequently;
```

explain generated SQL query

```
1  SELECT AI NARRATE show me what are the ten articles that were sold most frequently;
```

return a conversational result

general AI chat

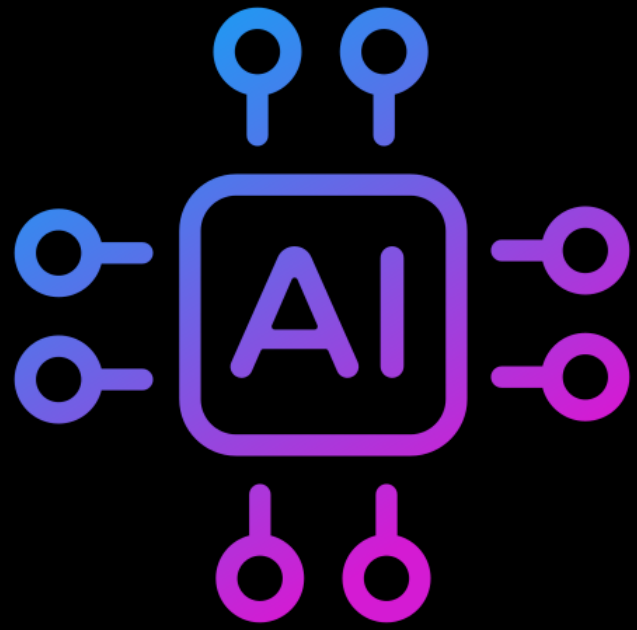
```
1  SELECT AI CHAT what is Oracle APEX;
```

Hyand

Chat with your Database.

Use the best LLM for your business and cloud deployment

- **OCI Generative AI**
- **OpenAI**
- **Azure OpenAI**
- **Cohere**
- **Google Gemini**
- **Anthropic**
- **Hugging Face**
- **more coming…**



Hyand

DevOps Made Easy!

Hyand

DevOps Made Easy!

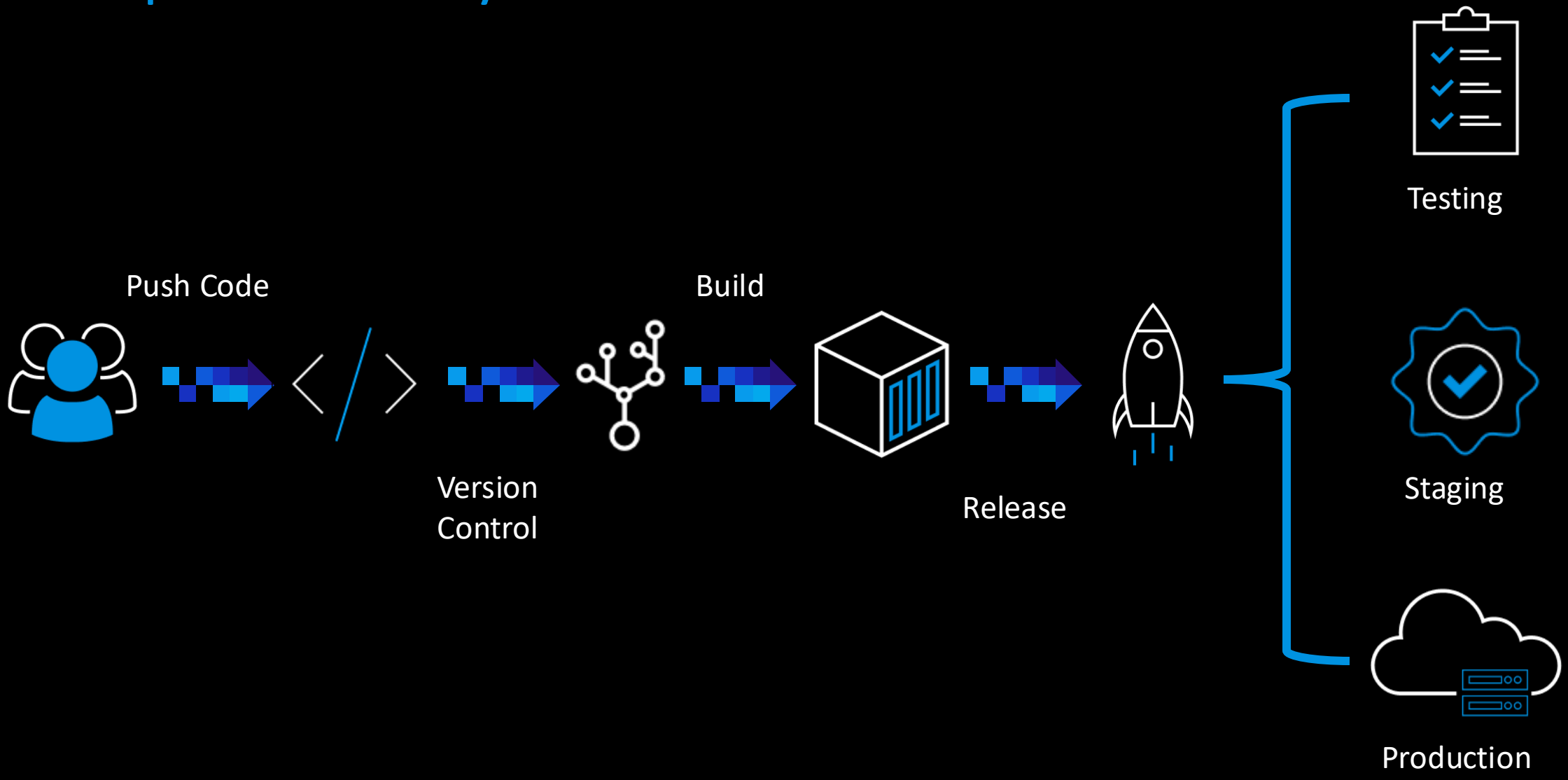
As an APEX Developer, you might be looking to apply modern development methodologies and tools used in other development platforms to your Oracle APEX Low-Code Projects.

This includes:

- Git-based code version management
- Code review
- Continuous delivery of apps from one instance to another
- Tracking issues
- Managing your team development

Hyand

DevOps Made Easy!



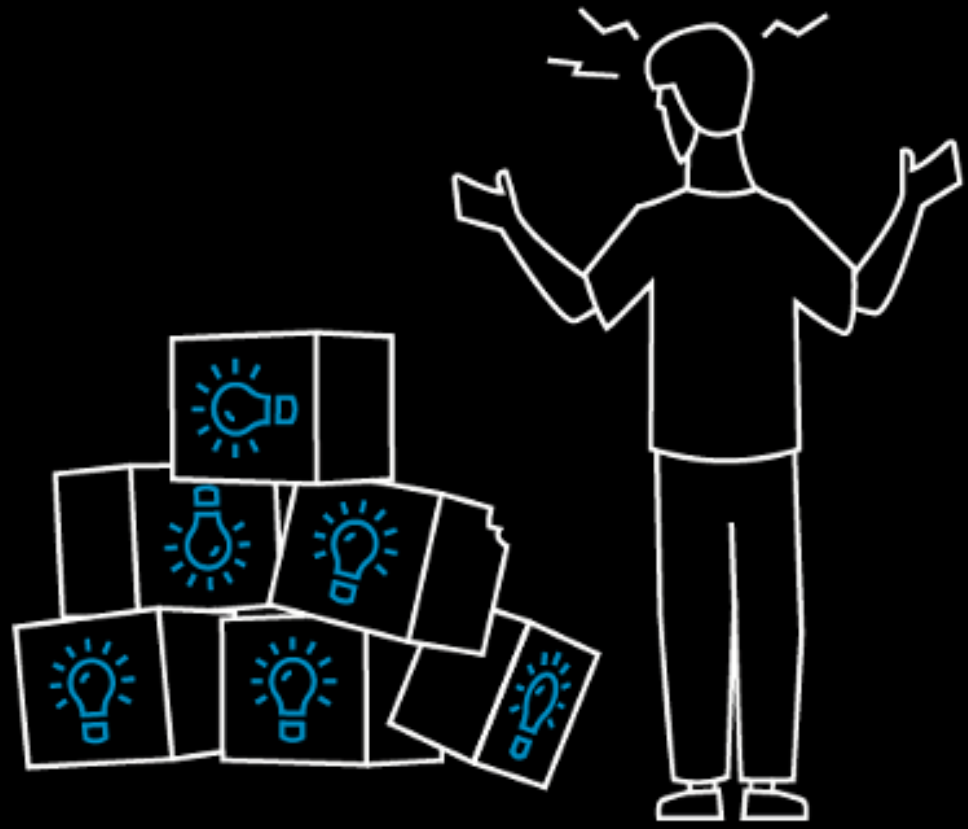
Hyand

DevOps Made Easy!

The Oracle Autonomous Database (ADB) includes the DBMS_CLOUD_REPO package, an extremely powerful package that provides easy access to files in Cloud Code (Git) Repositories.

With this package, you can:

- Manage repositories
- Handle code in a repository
- Export database schemas and objects
- Execute SQL statements from committed files



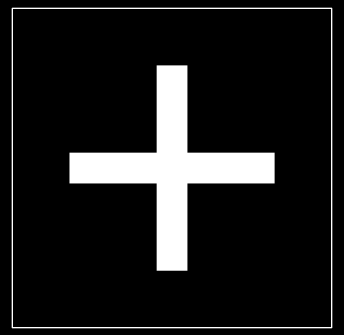
Hyand

Suported Code Repositories.

AWS CodeCommit

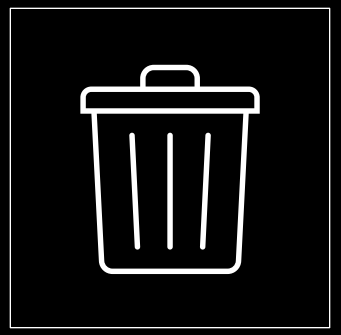
Azure Repos

Subprograms for the Repository Management Operations



CREATE_REPOSITORY

This procedure creates a Code Repository.

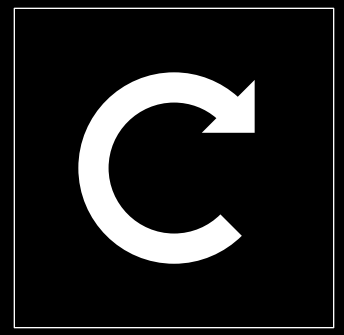


DELETE_REPOSITORY

This procedure deletes the Code Repository.

LIST_REPOSITORIES

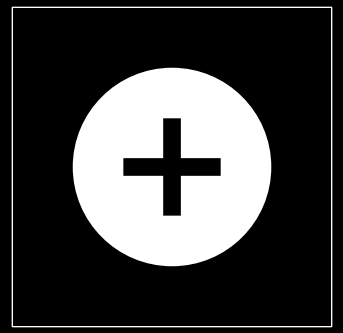
This function lists all the Code Repositories.



UPDATE_REPOSITORY

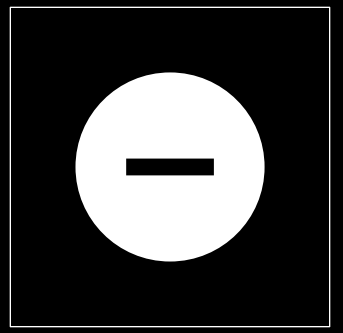
This procedure updates a Code repository.

Subprograms for the Repository Branch Management Operations



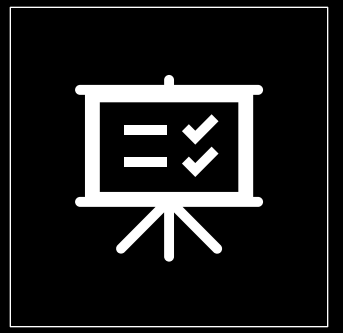
CREATE_BRANCH

This procedure creates a branch in a Code Repository.



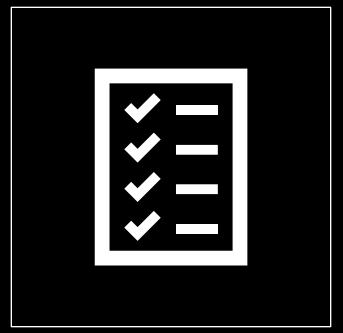
DELETE_BRANCH

This procedure deletes a branch in a Code Repository.



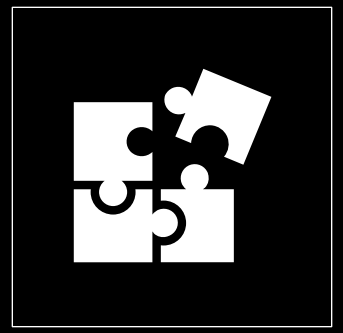
LIST_BRANCHES

This function lists all the Code Repository branches.



LIST_COMMITS

This function lists all the commits in a Code Repository branch.



MERGE_BRANCH

This procedure merges a branch into another specified branch in a Code Repository.

Create a new Repository

```
declare
     repoHandle     clob;
     repoCredential varchar2(50 CHAR) := 'GITHUB_CRED';     -- Name of the previously created credential
     repoName       varchar2(50 CHAR) := 'APEX_WORLD_2024'; -- Name of the new GitHub Repository
     repoOwner      varchar2(50 CHAR) := 'therwix';         -- Name of the GitHub Repository Owner
begin
    repoHandle := dbms_cloud_repo.init_github_repo(
                      credential_name => repoCredential,
                      repo_name       => repoName,
                      owner           => repoOwner
                  );

    dbms_cloud_repo.create_repository(
        repo        => repoHandle,
        description => 'Repo created with DBMS_CLOUD_REPO',
        private     => TRUE
    );
end;
/
```

Initialize a new Repository

```
declare
    repoHandle     clob;
    repoCredential varchar2(50 CHAR) := 'GITHUB_CRED';      -- Name of the previously created credential
    repoName       varchar2(50 CHAR) := 'APEX_WORLD_2024';  -- Name of the GitHub Repository
    repoOwner      varchar2(50 CHAR) := 'therwix';          -- Name of the GitHub Repository Owner
begin
    repoHandle := dbms_cloud_repo.init_github_repo(
                      credential_name => repoCredential,
                      repo_name       => repoName,
                      owner           => repoOwner
                  );

    dbms_cloud_repo.put_file(
        repo    => repoHandle,
        file_path => 'readme.md',
        contents => utl_raw.cast_to_raw('APEX WORLD 2024'),
        branch_name => 'main',
        commit_details => json_object('message' value 'DBMS_CLOUD_REPO commit',
                                      'author'  value 'therwix',
                                      'email'   value 'timo.herwix@mt-ag.com'
                                     )
   );

end;
/
```

Hyand

1

Introduction

2

Let´s dive deeper

3

Wrap-up

Hyand

Give it a try!

Is it possible to use a FREE tier in a production-ready architecture?!
How amazing would that be?!

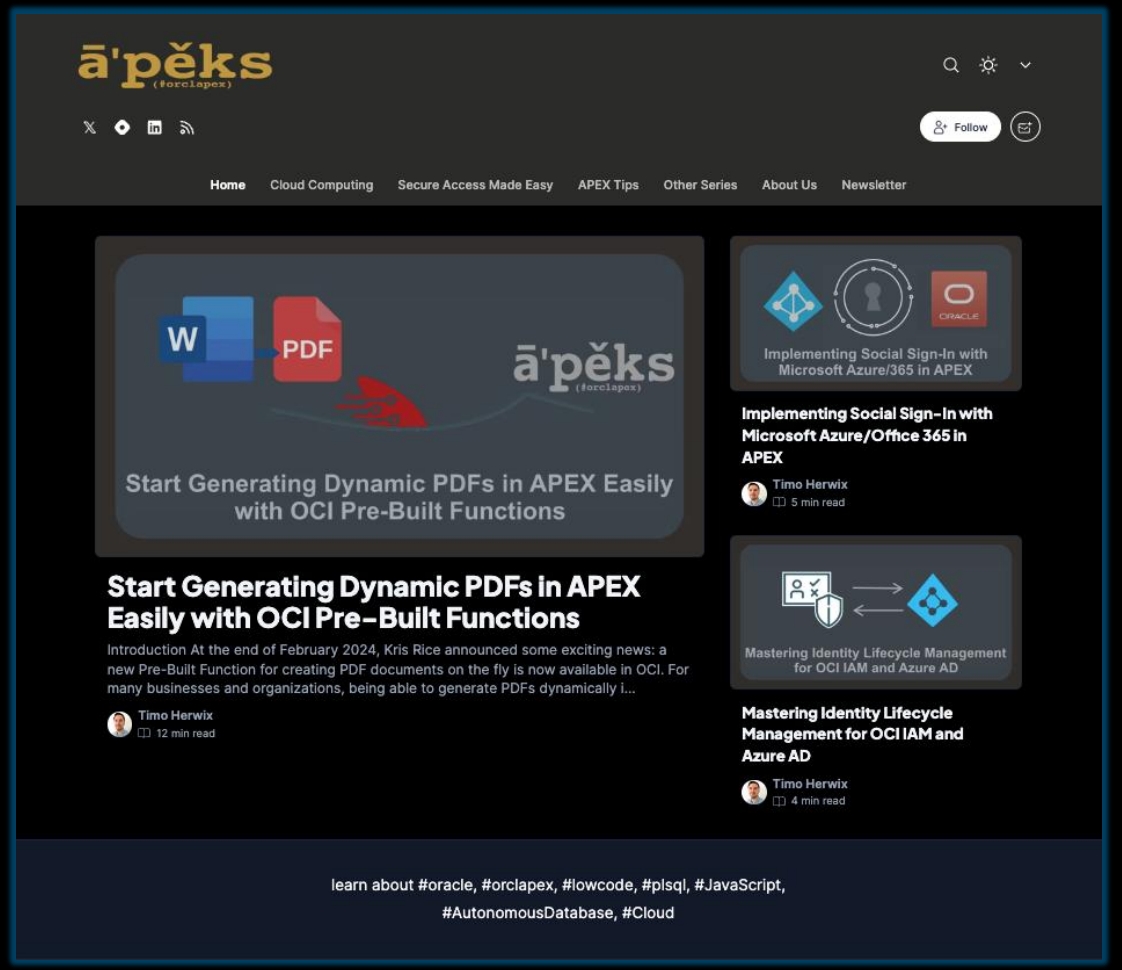
OMG!
Can you believe it?
We can totally use our own custom URL to boost our identity!
How awesome is that?!

Can we enable single sign-on? This will be a game-changer for our organization!

Yo, is the cloud really secure? Can we trust it to keep our stuff safe?

Blog

Scan me!


ā'pěks
(#orclapex)
Follow
Home
Cloud Computing
Secure Access Made Easy
APEX Tips
Other Series
About Us
Newsletter
W
PDF
ā'pěks
(#orclapex)
Start Generating Dynamic PDFs in APEX Easily with OCI Pre-Built Functions
Start Generating Dynamic PDFs in APEX Easily with OCI Pre-Built Functions
Introduction At the end of February 2024, Kris Rice announced some exciting news: a new Pre-Built Function for creating PDF documents on the fly is now available in OCI. For many businesses and organizations, being able to generate PDFs dynamically i...
Timo Herwix
12 min read
Implementing Social Sign-In with Microsoft Azure/365 in APEX
Implementing Social Sign-In with Microsoft Azure/Office 365 in APEX
Timo Herwix
5 min read
Mastering Identity Lifecycle Management for OCI IAM and Azure AD
Mastering Identity Lifecycle Management for OCI IAM and Azure AD
Timo Herwix
4 min read
learn about #oracle, #orclapex, #lowcode, #plsql, #JavaScript,
#AutonomousDatabase, #Cloud

Are you interested?

Timo Herwix
Senior Consultant

Telefon: +49 2102 30 961-0
Mobil: +49 176 20185455
Mail: timo.herwix@hyand.com

Timo Herwix

@Therwix

tm-apex.hashnode.dev

Hyand