

MIT

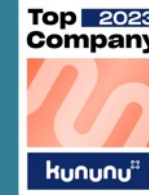


Oracle Autonomous Databases for APEX Developer.

Timo Herwix, Senior Consultant
APEX World Conference 2023

Facts and figures.

Your partner for digital transformation.
Individual IT solutions from one single source.



Foundation 1994



Headquarter

Ratingen

Branches

Frankfurt am Main,
Köln, München, Hamburg



> 360 Employees



approx. 48 Mio. €
Turnover in 2021



> 125 Customers
Cross-sector



Manufacturer-neutral



Certified partner
leading technology
manufacturer



Training company,
Partner in dual studies

Who am I?

Timo Herwix

Senior Consultant at MT 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



 Oracle ACE Associate

Agenda.



Introduction



Let's go deeper



Wrap-up





Get started with Oracle Cloud Infrastructure.

Get started with Oracle Cloud Infrastructure.



Source: <https://www.oracle.com/a/ocom/docs/cloud/oracle-cloud-infrastructure-platform-overview-wp.pdf>



Always Free Cloud Services.

Always Free Cloud Services.



Autonomous Database

2 Databases
20 GB storage



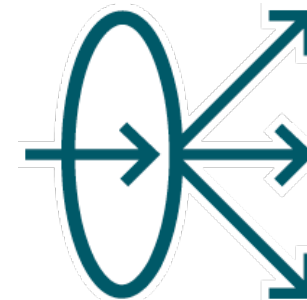
Compute

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
100 emails per day

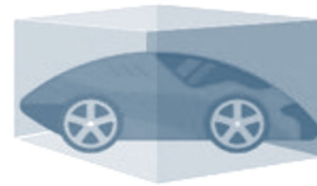
Oracle Autonomous Database.



- Everything is automated
- Nothing to learn
- Nothing to do
- Easiest to use and lowest cost



Self-Provisioning



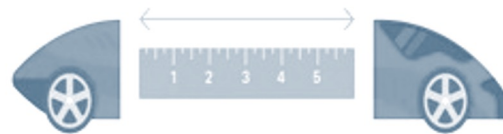
Self-Securing



Self-Managing



Self-Repairing



Self-Scaling



Self-Optimizing

Source: <https://questoraclecommunity.org/learn/blogs/oracles-autonomous-database-an-introduction/>



Compute Instances.



Bare Metal Server



Bare Metal Server



Bare Metal Server

Bare Metal (BM) Instance

Gives a dedicated physical server for highest performance and strong isolation.

Virtual Machine (VM) Instance

Runs on top of Bare Metal hardware. There is a hypervisor on top of Bare Metal server to virtualize it in smaller VMs. Ideal for running applications that do not require the performance and resources of an entire physical machine.

Dedicated VM Host

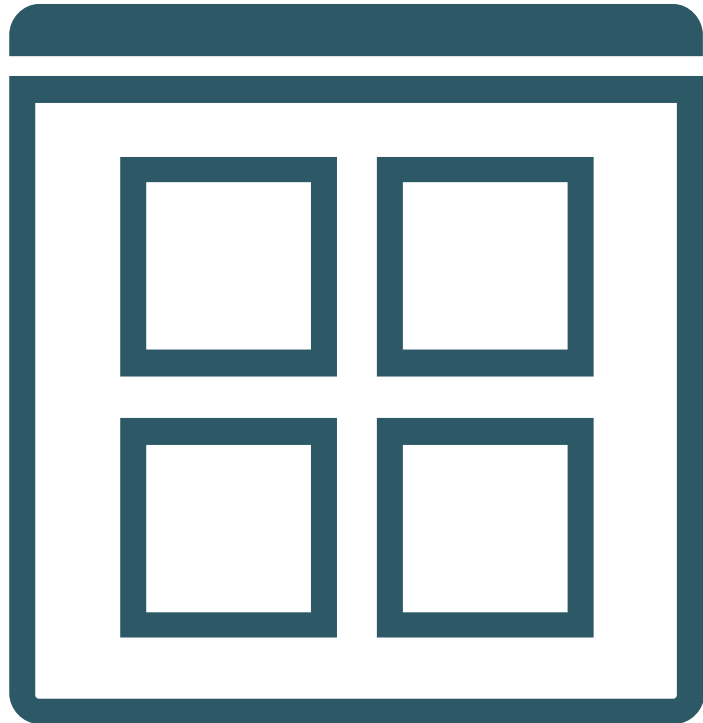
Is the combination of Bare Metal and Virtual Machine. In this multiple VMs are running on Bare Metal and the whole server is dedicated to a single tenant.

Object Storage.



- Internet-scale, high-performance storage platform
- Data managed as objects
- Ideal for unstructured data
- Regional, Public service
- Multiple storage tiers
- Private access from OCI resources
- Advanced capabilities

Block Storage.



- Store data on block volumes independently and beyond the lifespan of compute instances
- Create, attach, connect and move volumes, as needed, to meet your storage and application requirements
- Block Volume service lets you expand the size of block volumes and boot volumes without downtime
- Typical Scenarios
 - Persistent and durable storage
 - Expand an instance's storage
 - Instance scaling

Let's dive deeper into real-life scenarios.

The matter with the URL.

Automatically generated URL by OCI.

`https://rf0vpurtyuaq9ko-therwix.adb.eu-frankfurt-1.oraclecloudapps.com`

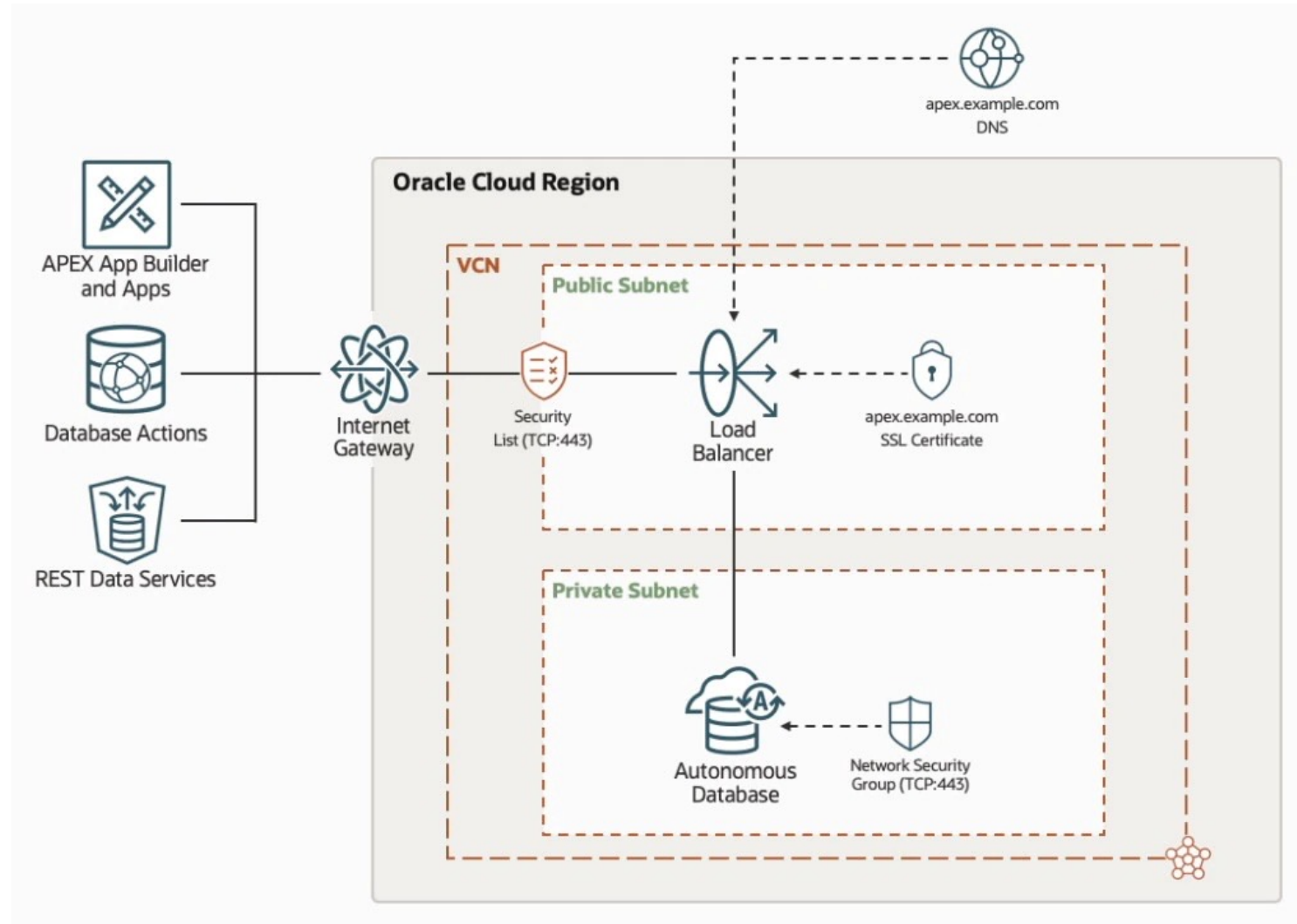
The URL is broken down into four parts, each indicated by a bracket and a label below it:

- `rf0vpurtyuaq9ko` is labeled as **Tenancy-ID**.
- `-therwix` is labeled as **Datenbank Name**.
- `.adb.eu-frankfurt-1` is labeled as **Datacenter Name**.
- `.oraclecloudapps.com` is labeled as **Root Domain**.

WHASUPP!?



Boost your brand identity with Vanity URLs for Oracle Autonomous Database via OCI Load Balancer.



Source: <https://blogs.oracle.com/apex/post/introducing-vanity-urls-on-adb>

Boost your brand identity with Vanity URLs for Oracle Autonomous Database via OCI Load Balancer.



Use only OCI services managed by Oracle



Social sign-in works

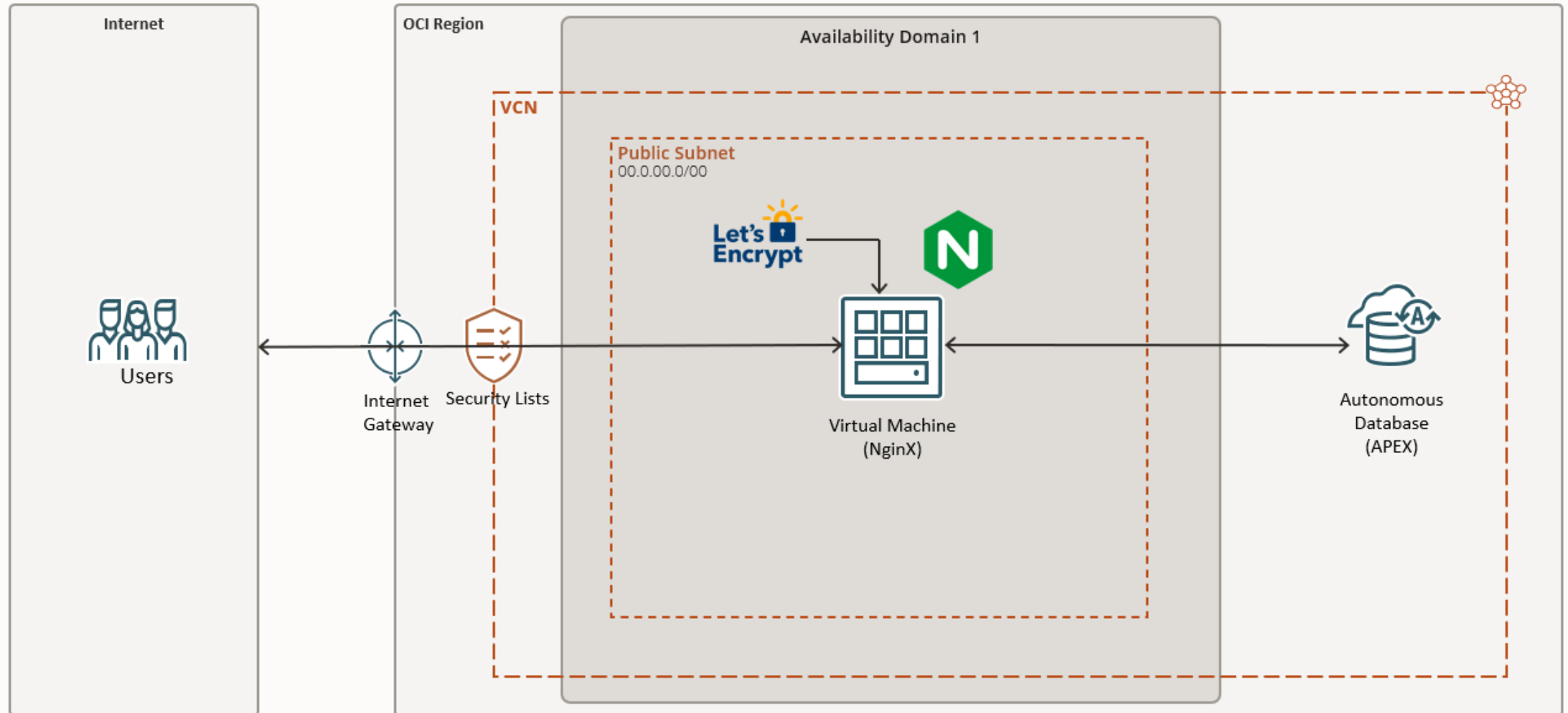


Cannot be implemented in a free tier



The renewal of the certificate is not automated

Custom URLs for Oracle Autonomous Database using NginX and let's encrypt.



Custom URLs for Oracle Autonomous Database using NginX and let's encrypt.



Can be implemented in a free tier



The renewal of the certificate is automated

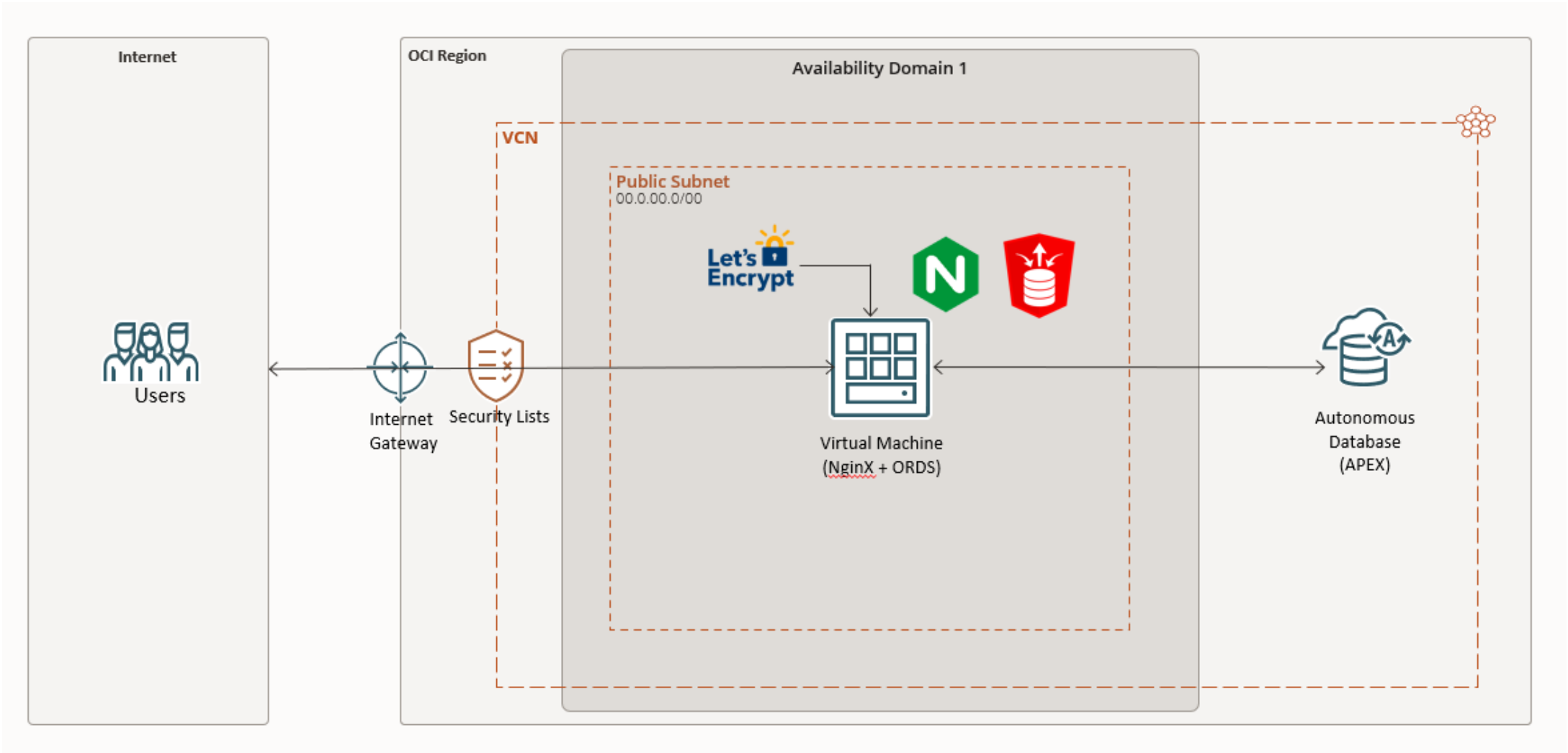


Use not only OCI services managed by Oracle



Social sign-in didn't work

Custom URLs for Oracle Autonomous Database Using Custom ORDS Server.



Custom URLs for Oracle Autonomous Database 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.

**There is a problem with the
volume size?**

Resize your OCI VM-Volume.



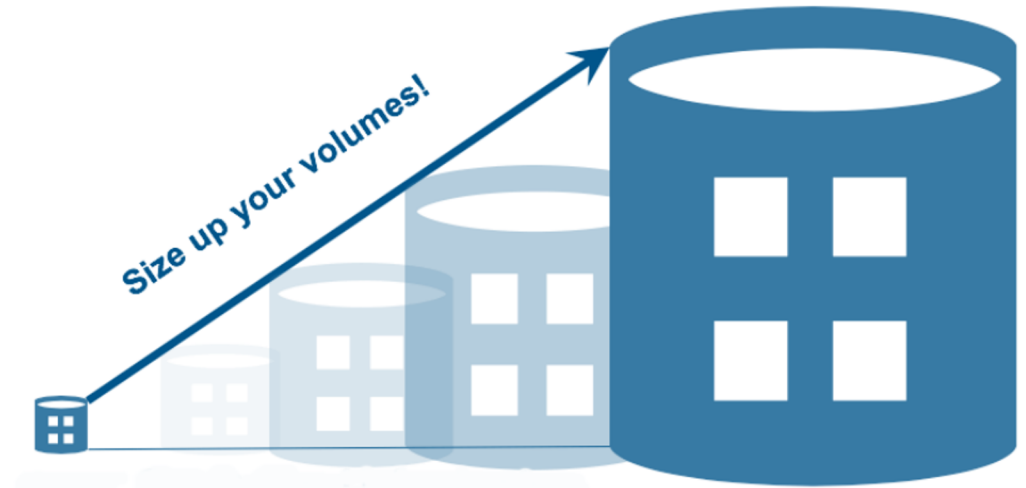
Resizing block or boot volumes is done online without affecting running applications



Access this feature for both existing and newly created volumes



After expansion, scan the disk again to expand the partition



What about security?

Social sign-in!

Use OCI to access APEX.



Single sign-on for everybody!

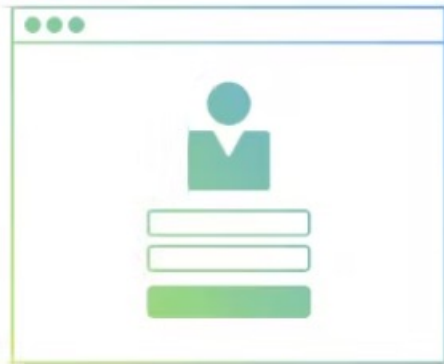
- Use the same username/password credentials as OCI
- OCI allows multi-factor authentication



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

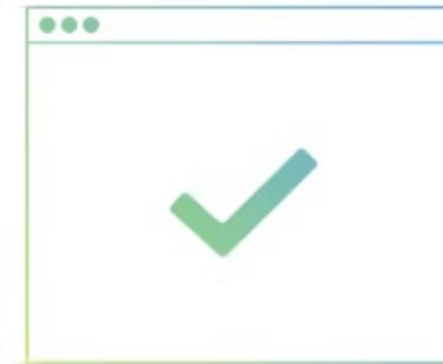
Password



Proof



Secure Access



Source: Screenshot / Oracle Cloud

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

Protect your public server!

Be aware of DDoS attacks!



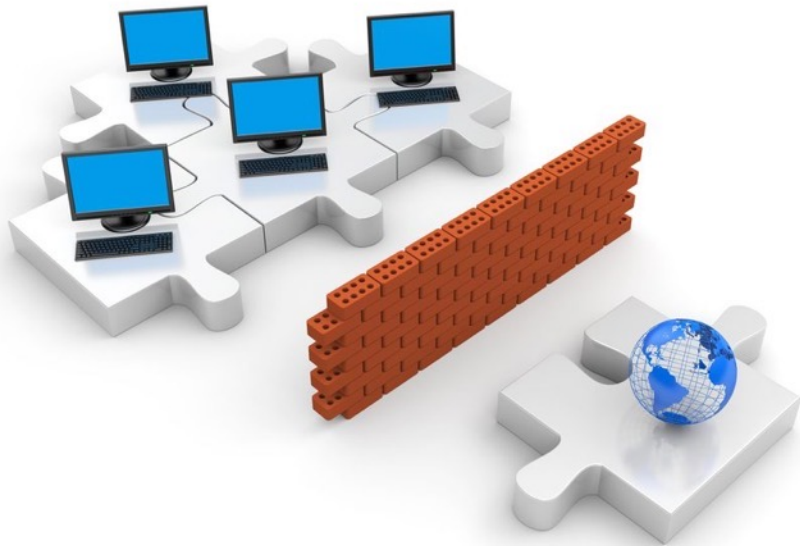
Source: <https://cloud.ionos.com/network/ddos>

What can you do?

- Outsource your DNS to offload attack together by using OCI DNS services
- Filter fake requests and protect your app with the OCI Web-Application-Firewall
- Filter bad traffic
- Throttle-down the requests in your proxy server with “event MPM” module

Network-Access-Control!

Specify IP addresses that are allowed to access



Source: <https://ndisac.org/dibsc/implementation-and-assessment/top-10-high-value-controls/perimeter-hardening/>

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.

ORACLE Cloud

Error code: 403

❌ IP Address Rejected

Your client needs to be part of this database's Access Control List to access this page.

[How to configure network access with Access Control Rules \(ACLs\)](#)

Request ID: 8849547c27daaebcbe55e773c9958aa0

Not enough database storage?



STOP

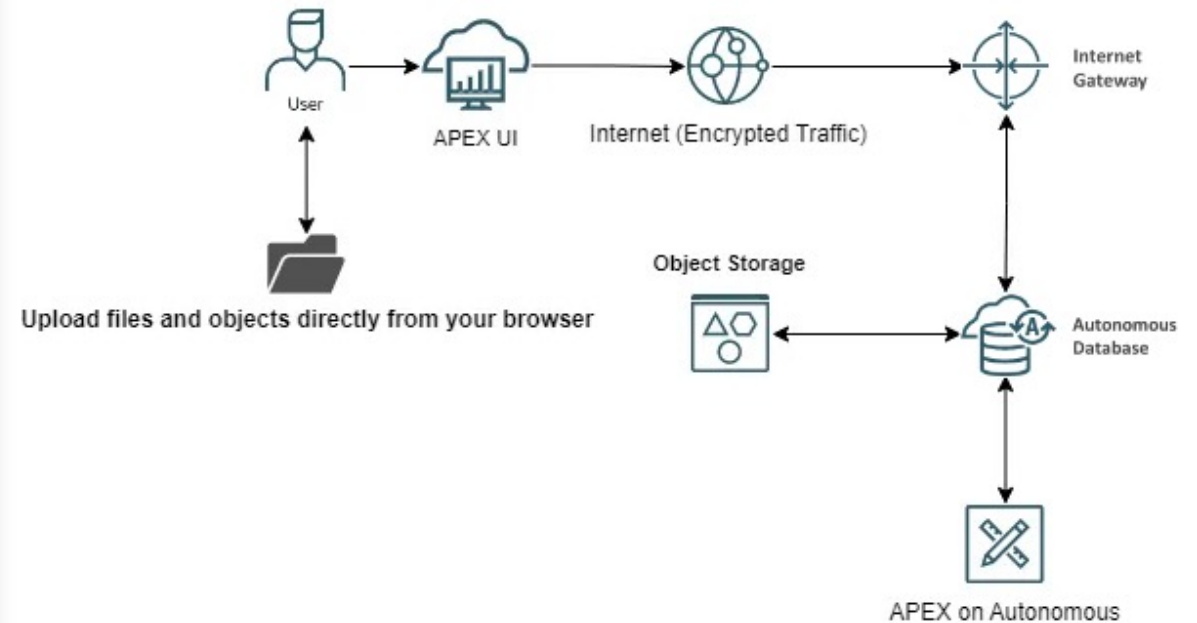
If you are storing files (images, pdfs etc.) in BLOBs in the database, then stop!!!

Storing files in object storage is cheaper and reduces the size of your database to speed up backups, clones etc.

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 `APEX_WEB_SERVICE` PL/SQL API to **GET**, **PUT** and **DELETE** files in OCI object store
- Quick and **easy** to integrate
- If you like, enable **object versioning**



What about backup?



**OCI creates incremental backups at the free level,
but you cannot restore from those backups!!!**

The responsibility for backups and restoring is entirely yours.

Create your own backup by exporting everything.

Backing up Data/DDL

1. Schedule data pump schema exports to the DB file system (DATA_PUMP_DIR) every night
2. Schedule to copy the data pump files to OCI object storage

Backing up APEX Application(s)

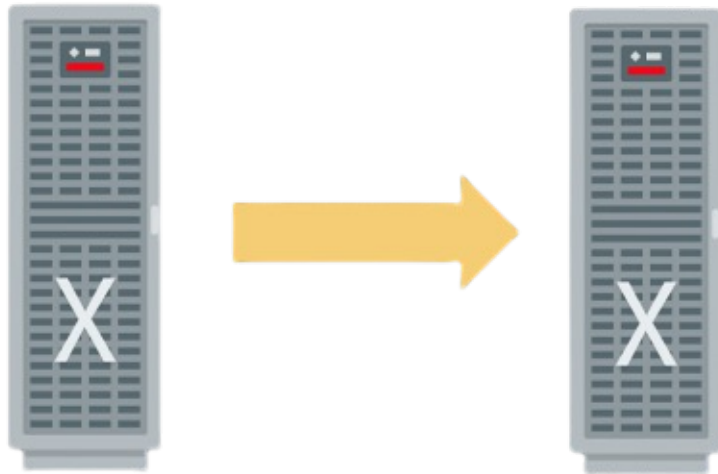
1. Schedule an APEX export by using apex_export.get_application for each application
2. Schedule to copy the exported APEX applications to OCI object storage



With this you can set up a 2nd ADB with data from the previous evening within one to two hours

Infrastructure as a Service (IaaS).

Clone your ADB by using the
OCI REST APIs



```
1  POST /20160918/autonomousDatabases
2  {
3      "compartmentId" : "ocid.compartment.oc1.<unique_ID>",
4      "displayName" : "CLONE",
5      "dbName" : "CLONE",
6      "adminPassword" : "<password>",
7      "cpuCoreCount" : 1,
8      "licenseModel" : "LICENSE_INCLUDED",
9      "dataStorageSizeInTBs" : 1,
10     "isFreeTier" : true,
11     "source" : "DATABASE",
12     "sourceId" : "ocid1.autonomousdatabase.oc1.phx.<unique_ID>",
13     "cloneType" : "FULL"
14 }
```



Wrap-up.

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?!

YES YOU CAN!

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?

Useful links.

- <https://tm-apex.hashnode.dev/>
- <https://knowledgebase.mt-itsolutions.com/>
- <https://dgielis.blogspot.com/2019/09/best-and-cheapest-oracle-apex-hosting.html>
- <http://nielsdebr.blogspot.com/2022/01/protect-your-public-server.html>
- <https://blog.cloudnueva.com/>
- <https://fuzziebrain.com/content>

Are you interested?



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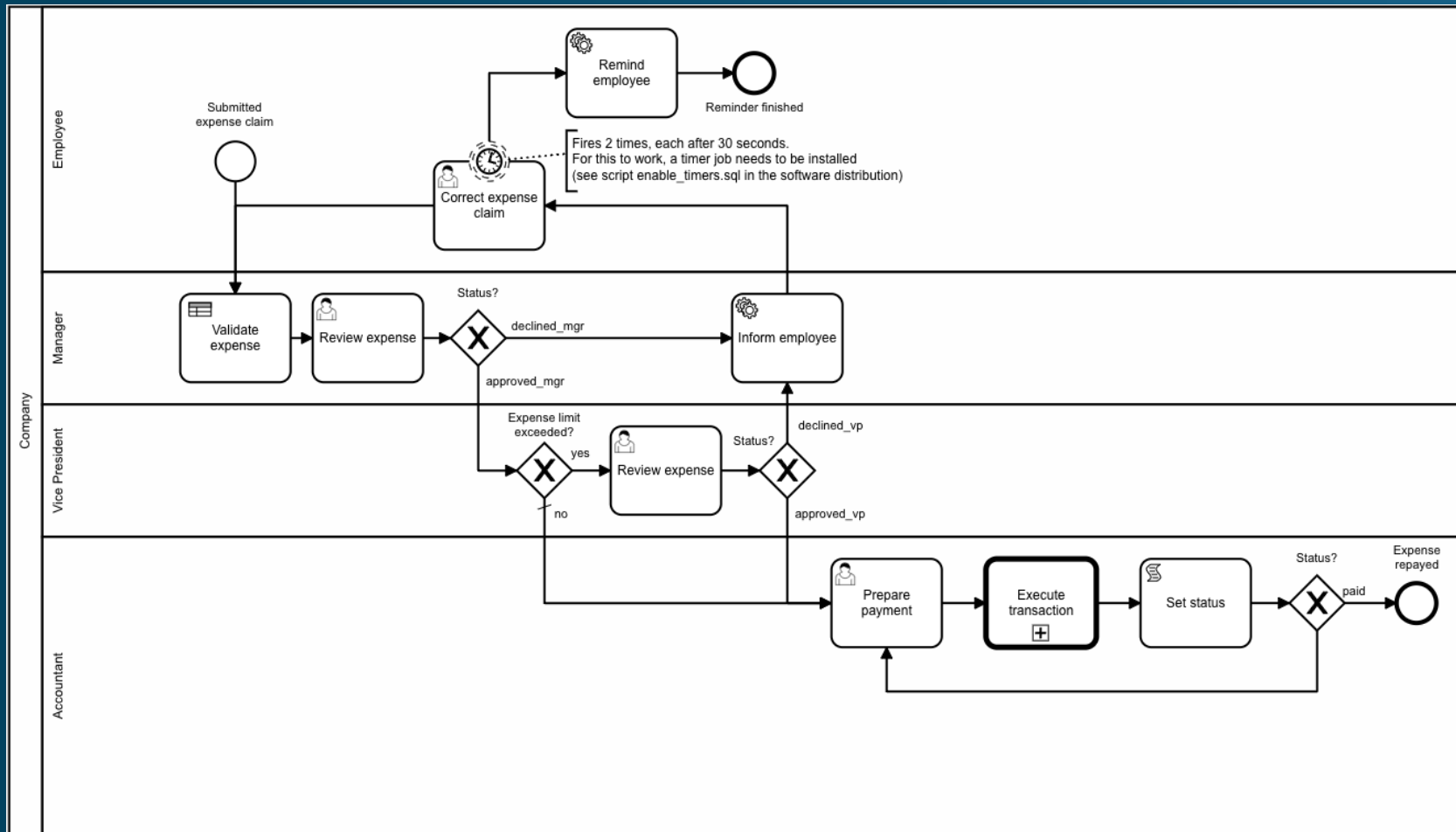
@Therwix



tm-apex.hashnode.dev

Flows for APEX

BPMN 2.0 Workflows for APEX



- Open Source
- Community Driven
- Support available



Testing APEX Apps is now as easy as creating them.

- Tailored to APEX
- Save a lot of time on regression tests
- Use our intuitive LCT-App and don't write any test code
- Testing on multiple platforms simultaneously



LCT



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