

Oracle Databases in a Multicloud World

An Assessment of Viability

Kerry Osborne | February 2023 | #RMOUG2023



Uber goes multicloud, announcing big deals with Oracle and Google

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01

whoami

Kerry Osborne – Database Black Belt Team Lead @ Google

- Dev->DBA->Biz->Tuning->Biz->Dev->Biz ...
- Performance and Internals Focused
- ThinkSpark->PE Firm, Enkitech->Accenture, Gluent->Google
- Wrote a Couple of Books
- Never Worked for Oracle
- Started w/ Oracle V2 🤖 (I was only 12 at the time)



ORACLE
ACE Director
Alumni

gluent.

enkitech

accenture



02

**Why are we talking
about this?**

In the News

Google, Deutsche Bank Agree to 10-Year Cloud Partnership

- Deal said to include joint technology investments, research
- Bank expects 1 billion-euro return on investment in partnership

Deutsche Bank signs multi-year database deal with Oracle

24 June 2021



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Uber goes multicloud, announcing big deals with Oracle and Google

This Presentation is Based on a Whitepaper – Project Solomon

Use the best of both worlds

When you use Google Cloud and Oracle Cloud Infrastructure (OCI) together, you can build a multicloud solution that harnesses the unique capabilities of each platform. Our whitepaper explains how to connect these clouds together to create a robust, multicloud, Oracle environment.

[Read the whitepaper](#)



<https://cloud.google.com/multicloud>

<https://services.google.com/fh/files/misc/google-cloud-oci-guide.pdf>

02

**What do we mean by
"multicloud"?**

Multicloud

Ultimate Flexibility

Services, such as database engines, that can be seamlessly created and managed from a single UI, running on whichever platform you choose, and readily migrated to another.

Cross/Composite Multicloud

Components of a system running in different public clouds, e.g. an application tier running in one public cloud utilising a database in another public cloud.

03

What is Oracle Database Service for Azure?

What is Oracle Database Service for Azure?

Oracle Database in OCI



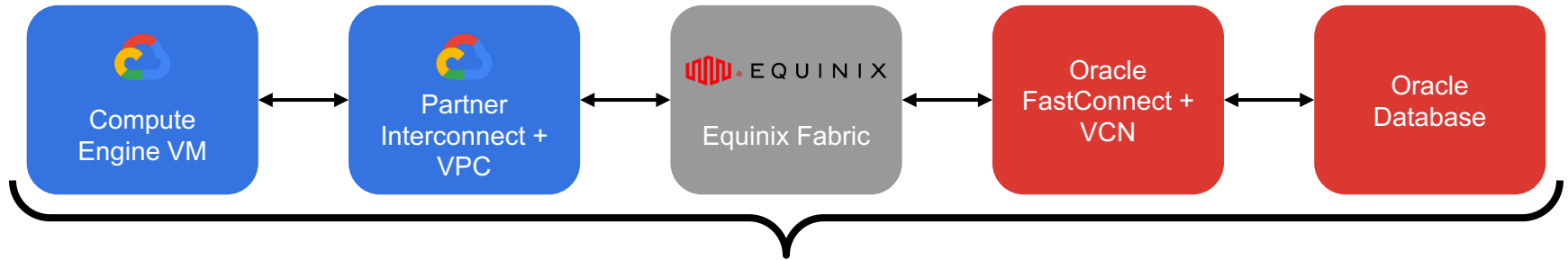
Application tier in Azure



04


**What if Azure is not your
preferred public cloud?**


Network Infrastructure Components



Multicloud Logical Network Interconnect in Ashburn, Virginia, USA
Data does not traverse the public internet ✓

Equinix Console

 EQUINIX | FABRIC AND NETWORK EDGE

 **Connections** ▾ Network Edge ▾ Ports ▾ Service Tokens ▾ Build Solutions **Beta** ▾ Inventory ▾ My Company ▾ Administration ▾ Support ▾


Connections


Filters ▾

All Categories ▾



equinix-gcp-oci

Primary

 Ashburn
Origin


 ORACLE


Oracle Cloud Infrastructure -OCI-
FastConnect (Ashburn)
Destination





equinix-gcp-oci

Primary

 Ashburn
Origin

 Google Cloud

Google Cloud Partner Interconne
ct Zone 1 (Ashburn)
Destination



Oracle Database Endpoint

Autonomous Database InformationToolsTags

General Information

Database Name: SALARIESDB

Workload Type: Transaction Processing

Compartment: gbadamassi (root)/test

OCID: ...7hltq Show Copy

Created: Fri, Jul 29, 2022, 20:51:26 UTC

OCPU count: 1

OCPU auto scaling: Enabled ⓘ

Storage: 1 TB

Storage auto scaling: Disabled ⓘ

License Type: License included

Database Version: 19c

Lifecycle State: Available Check database availability

Instance Type: Paid

Character Set: AL32UTF8

National Character Set: AL16UTF16

Auto Start/Stop Schedule: Disabled Schedule

Mode: Read/Write Edit

Associated Services

Database Management: Not Enabled Enable ⓘ

Operation Insights: Not Enabled Enable

APEX Instance

Instance Name: salaries-db

Infrastructure

Dedicated Infrastructure: No

Autonomous Data Guard ⓘ

Status: Disabled Enable

Backup

Last Automatic Backup: Fri, Jul 29, 2022, 22:29:50 UTC

Manual Backup Store: Not Configured

Network

Access Type: Virtual Cloud Network

Virtual Cloud Network: oci_gcp_tunnel_vcn

Subnet: oci_gcp_tunnel_subnet

Private Endpoint IP: 10.0.0.158 Hide Copy

Private Endpoint URL: ...ud.com Show Copy

Network Security Groups: None Edit

Mutual TLS (mTLS) Authentication: Not Required Edit

Maintenance ⓘ

Patch Level: Regular ⓘ

Next Maintenance: Sun, Jul 31, 2022, 00:00:00 UTC - 02:00:00 UTC View History

Customer Contacts: None ⓘ Manage

Encryption

Encryption Key: Oracle-managed key

Network

Access Type: Virtual Cloud Network

Virtual Cloud Network: oci_gcp_tunnel_vcn

Subnet: oci_gcp_tunnel_subnet

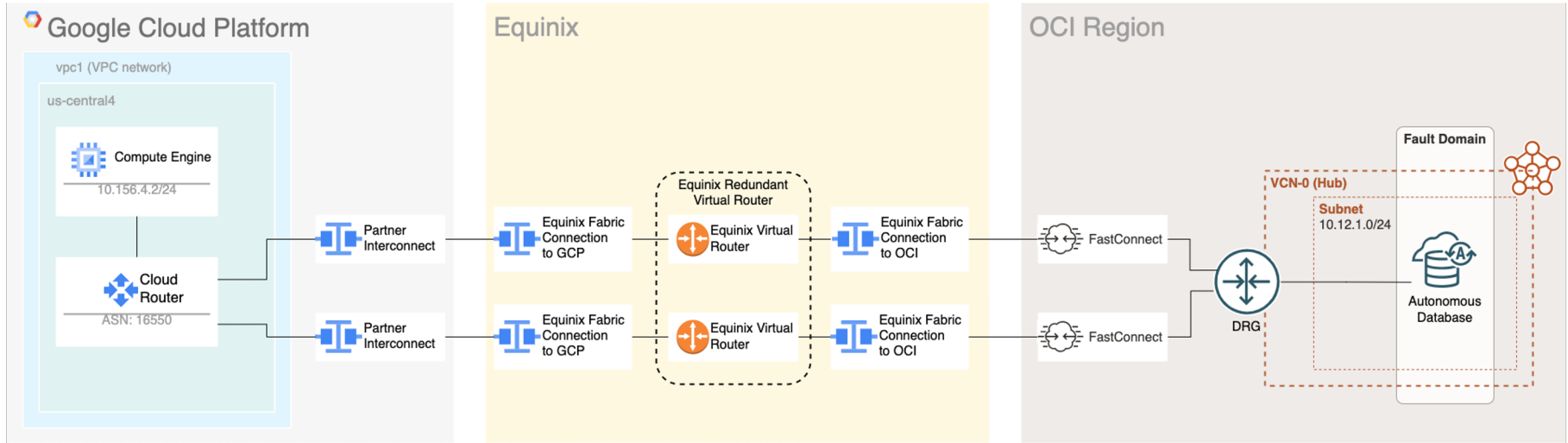
Private Endpoint IP: 10.0.0.158 Hide Copy

Private Endpoint URL: ...ud.com Show Copy

Network Security Groups: None Edit

Mutual TLS (mTLS) Authentication: Not Required Edit

Redundant Connectivity



05

Testing performance using Swingbench

Test Method

Q: What's the best way to test the impact of network latency on an application?

A: Use the application or a realistic test application.

Test Method

Q: What type of application will feel the impact of network latency the most?

A: "Chatty" applications performing many short interactions with the database over the network.

Test Method

Q: What should we use for a comparison?

A: An all-OCI architecture.

Results

Maximum think time	10 ms		100 ms	
Component deployment model	Single cloud	Composite multicloud	Single cloud	Composite multicloud
Total transactions	129,979	108,236	17,353	17,357
Average transactions per second	433.26	360.79	57.84	57.86
Average response time (ms)	31.30	49.88	37.10	51.94
Minimum response time (ms)	2	4	2	4
Maximum response time (ms)	1499	467	619	349

Where is this possible?

- Metros with Google Cloud, OCI, & Equinix
- Google Cloud Regions without OCI & Equinix in the same metro

Conclusions

CIO, “Is multicloud viable?”

Engineer, “It depends.”

CIO, 🤔

Test, test, test, and test some more!

06

Monitoring in a **multicloud** environment

OCI Monitoring API

Basic Python to fetch the average CPU utilization for the previous minute

```
monitoring_client.summarize_metrics_data(  
    compartment_id="<compartment_id>",  
    summarize_metrics_data_details=oci.monitoring.models.SummarizeMetricsDataDetails(  
        namespace="oci_autonomous_database",  
        query="CpuUtilization[1m].mean()",  
        start_time=datetime.now() - timedelta(minutes=2),  
        end_time=datetime.now() - timedelta(minutes=1),  
        resolution="1m",  
    ),  
    retry_strategy=oci.retry.DEFAULT_RETRY_STRATEGY,  
)
```

Database Details

Assigned Cores

1 vOCPU

CPU Utilization



AAS



07

Opening up new opportunities

Before questions

What have we seen?

1. Secure traffic between clouds is possible via private interconnect
2. Impact of network latency is highly dependent on the nature of the application, specifically transaction "think time"
3. Metrics for OCI services, including Autonomous Databases, are available via published APIs
4. Streaming data from OCI to Google Cloud is possible

08

Questions?

Kerry Osborne

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Thank you.