



Cloud Hybrid Connectivity

Bursting resources

By Sonia Serrano

Sonia Serrano

A black and white photograph of a person's hands typing on a laptop keyboard. The person is wearing a dark long-sleeved shirt. A white cup, likely containing coffee, is visible in the background. The laptop is open, and the keyboard is clearly visible. The overall scene suggests a professional or business environment.

Executive Summary

The company "Paws and claws" is an online store dedicated to selling pet food, toys, and health products for pets in the US west region. Due to the pandemic, the store has experienced exponential growth in online orders, moving from only 20 percent of its total annual sales to around 80 percent last year. The company is looking to move its current e-commerce system to the public cloud to handle the business growth.

PROBLEM

TECHNOLOGY GAP

Monolithic architecture and outdated tools

CUSTOMERS

300% increase of online sales during pandemic

SECURITY

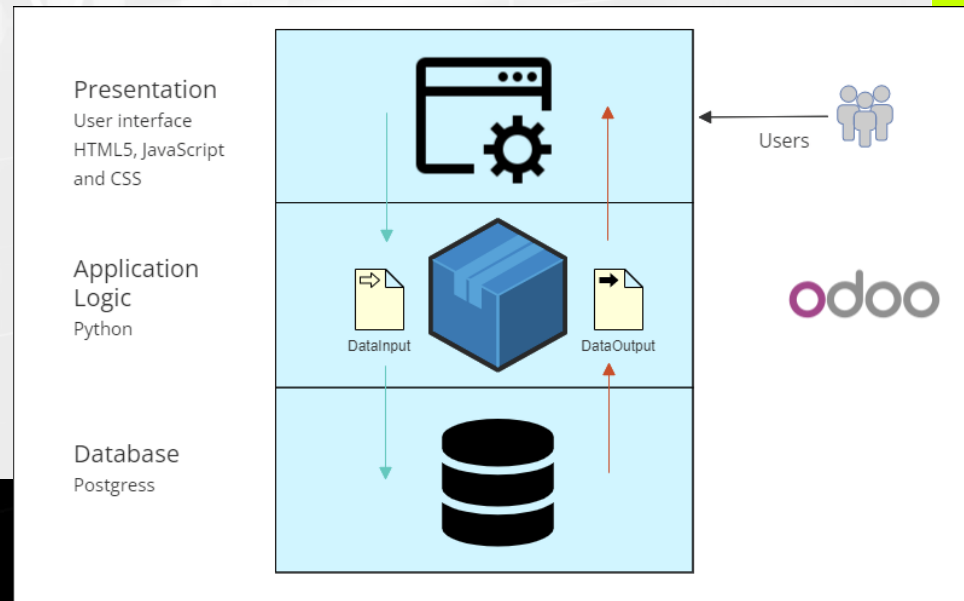
Need to store customer data in a private network without internet access

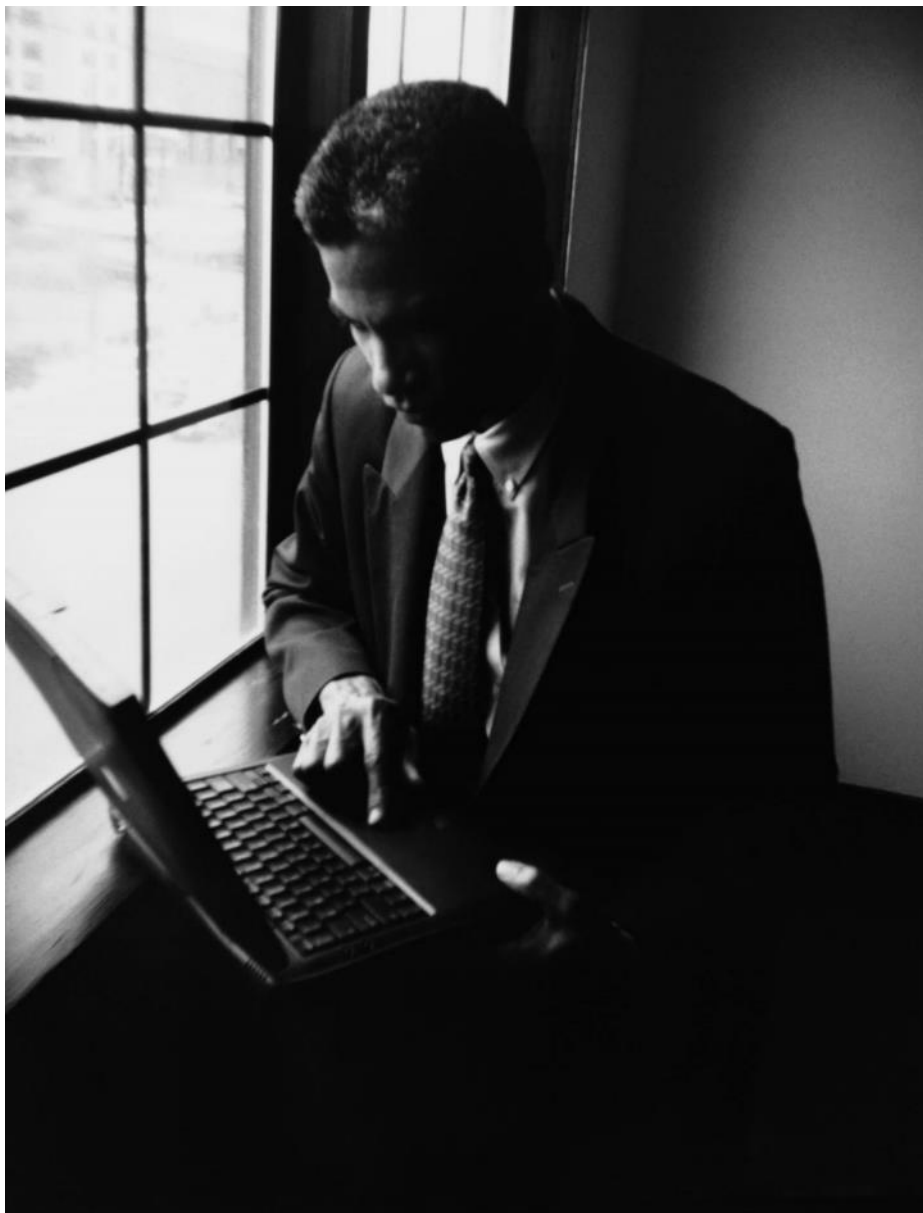
AVAILABILITY

Loss of potential income by not having high availability in their shopping portal

USABILITY

Server downtime and latency issues





SOLUTION

CLOSE TECH GAP

Separate front-end from back-end and cloud migration

CUSTOMERS

Scalability and High Availability

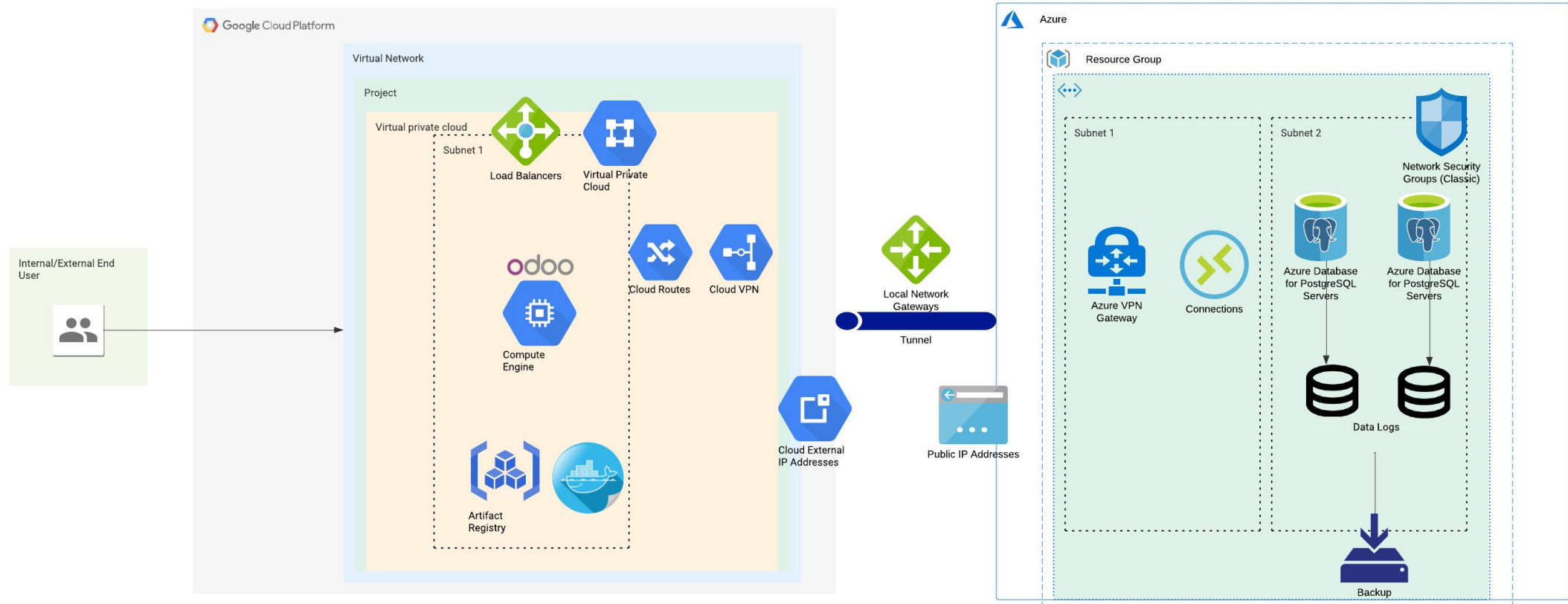
COST

Pay as you go model

SECURITY AND GOVERNANCE

Customer data remains in a private network

Solution Diagram





SOLUTION STEPS

Stages

1

- Setup VPC
- Establish hybrid connection

2

- Create Artifact registry
- Configure docker image
- Create Virtual Machine
- Create managed group
- Create load balancer

3

- Create database
- Configure database
- Edit network security groups

4

- Connect database with Virtual Machine
- Activate CDN to cache backend content
- Customize Application

5

- Test application
- Test database

1

Hybrid connection and user accounts



<input type="checkbox"/>	Name ↑	Cloud VPN gateway (IP)	Peer VPN gateway (IP)	Cloud Router BGP IP address	Peer BGP IP address	Routing type	IP stack type ?	VPN tunnel status	BGP session	
<input type="checkbox"/>	vpn-tunnel-to-azure-project (Classic)	vpn-gw-project 34.125.189.135	20.118.135.196	none	none	Route-based	IPv4	✓ Established	--	⋮

Refresh Move Download configuration Delete

^ Essentials

[JSON View](#)

Resource group ([move](#)) : [azure-to-gcp](#)

Status : **Connected**

Location : West US 3

Subscription ([move](#)) : [Azure for Students](#)

Subscription ID : 4df18f51-209b-4d3b-ab47-dd01aef3d5fa

Tags ([edit](#)) : [Click here to add tags](#)

Data in : 138.15 MiB

Data out : 158.92 MiB

Virtual network : [azure-to-gcp-vnet](#)

Virtual network gateway : [vnet-gateway \(20.118.135.196\)](#)

Local network gateway : [local-gateway \(34.125.189.135\)](#)

Artifact registry

2



Filter Enter property name or value

<input type="checkbox"/>	Name ↑	Format	Location	Description	Labels	Version policy ?	Encryption ?	Encryption key	Created	Updated	Size
<input type="checkbox"/>	sserrano3440-project	Docker	us-west4 (Las Vegas)				Google-managed key	—	13 days ago	13 days ago	530.1 MB

Virtual Machine

Filter Enter property name or value

?

<input type="checkbox"/>	Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input type="checkbox"/>	✓	odoo-project	us-west4-a			10.2.1.4 (nic0)	34.125.223.125 (nic0)	SSH ▾ ⋮

OVERVIEW

DETAILS

MONITORING

ERRORS

Instances by status

1 instance



1

Instance by health ?

✓ 100% healthy

Healthcheck [odoo-healthcheck](#)

Autoscaling ⓘ

On (min 1, max 3)

Predictive autoscaling is off. [Change](#)

Status	✓ Ready
Creation Time	Aug 2, 2022, 11:23:02 PM UTC-04:00
Description	
Number of instances	1
Template	instance-template-odoo-2
Location	us-west4-a

Instance Group Members

⊖ REMOVE FROM GROUP

🗑 DELETE INSTANCE

Filter Enter property name or value

?

⋮

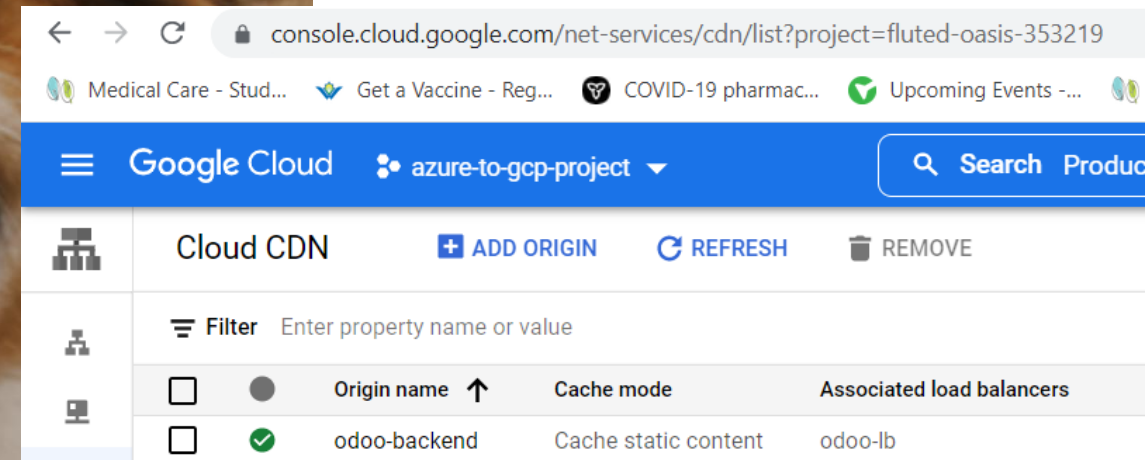
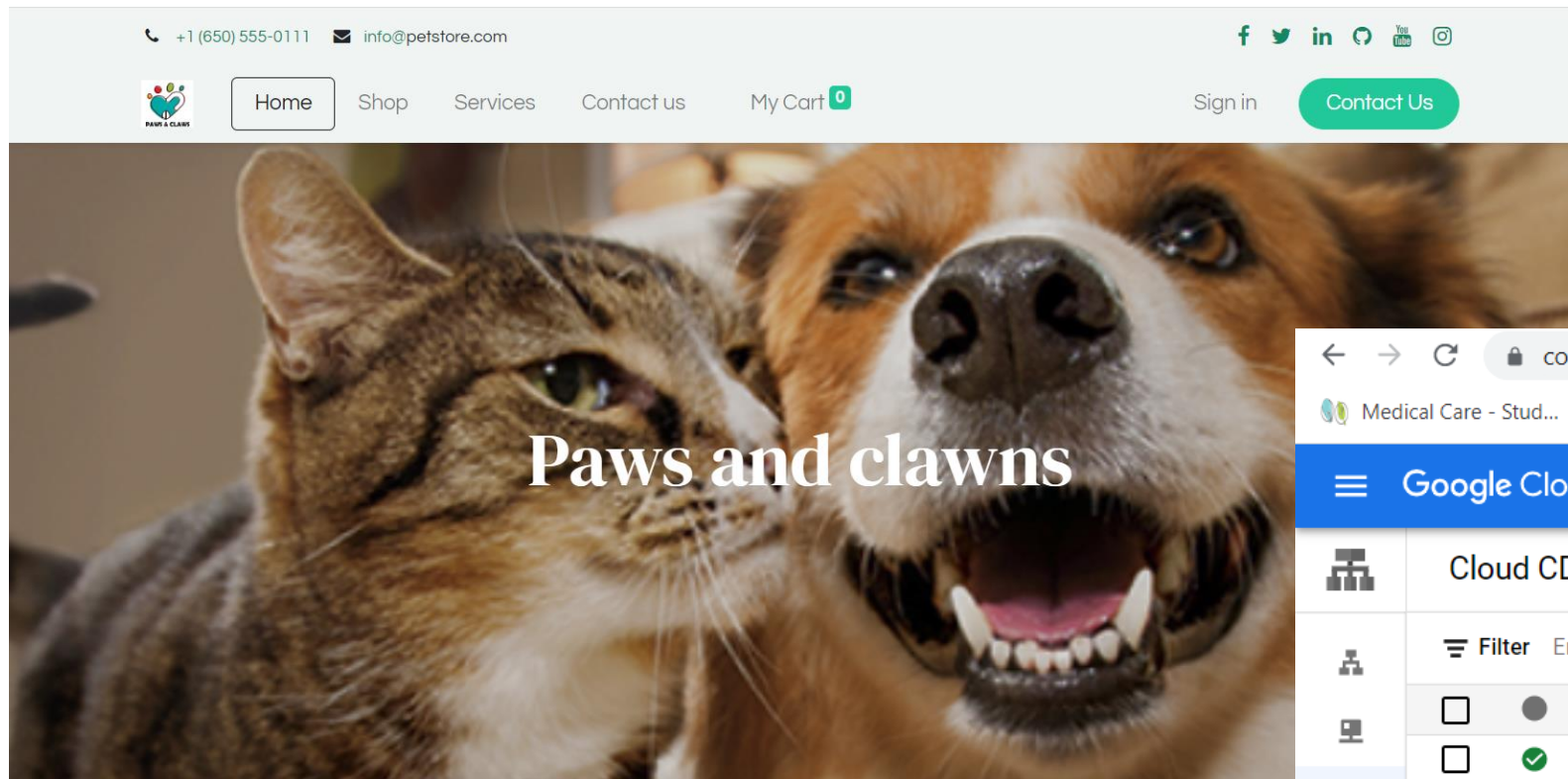
<input type="checkbox"/>	Status	Name ↑	Creation Time	Template	Per instance config	Internal IP	External IP	Health Check Status	Connect
<input type="checkbox"/>	✓	instance-group-odoo-59xv	Aug 2, 2022, 11:23:20 PM UTC-04:00	instance-template-odoo-2		10.2.1.5 (nic0)	34.125.235.223 🗑	✓ Healthy	SSH ▾

Managed group

4

Connect, customized application and activate CDN

```
sos_bj9@odoo-project:~$ docker run -v odoo-data:/var/lib/odoo -d -p 8069:8069 --name odoo -e HOST=10.1.3.4 -e PORT=5432 -e USER=odoo -e PASSWORD=Secret55 -t odoo
```



5

Test database

odoo

Filter

ENTITIES 586

- > utm_tag_rel
- > validate_account_move
- > web_editor_converter_test
- > web_editor_converter_test_sub
- > web_tour_tour
- > website
- > website_base_unit
- > website_configurator_feature
- > website_country_group_rel
- > website_lang_rel
- > website_menu
- > website_page
- > website_rewrite
- > website_robots
- > website_route
- > website_sale_extra_field
- > website_sale_payment_acquirer_onbo...

Query #1

```
1 select name, url, create_date from website_menu
```

name	url	create_date
Default Main Menu	/default-main-menu	2022-07-29 04:50:28.586386
Home	/	2022-07-29 04:50:28.586386
Contact us	/contactus	2022-07-29 04:50:28.586386
Top Menu for Website 1	/default-main-menu	2022-07-29 04:50:28.586386
Shop	/shop	2022-07-29 04:53:46.721501
Home	/	2022-07-29 04:50:28.586386
Shop	/shop	2022-07-29 04:53:46.721501
Services	/our-services	2022-07-29 04:58:21.315555
Contact us	/contactus	2022-07-29 04:50:28.586386

Query #1

```
1 select * from product_template
```

id	message_main_a...	name	sequence
2	(NULL)	Toy	1
1	(NULL)	Dog Food	1
3	(NULL)	House	1
6	(NULL)	Dog rewards	1
4	(NULL)	Kennel	1
7	(NULL)	Dry Dog Food	1
5	(NULL)	Dog collar	1

Test instance group new IP

5

Instance Group Members

⊖ REMOVE FROM GROUP

🗑 DELETE INSTANCE

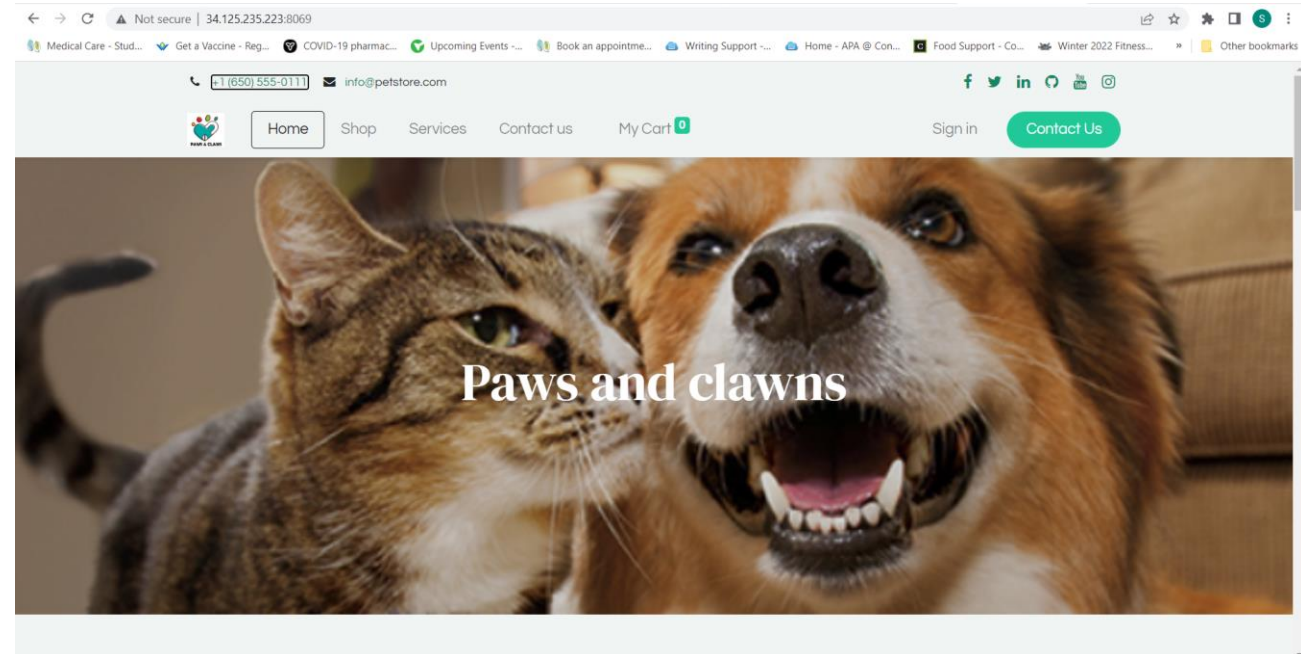
Filter Enter property name or value

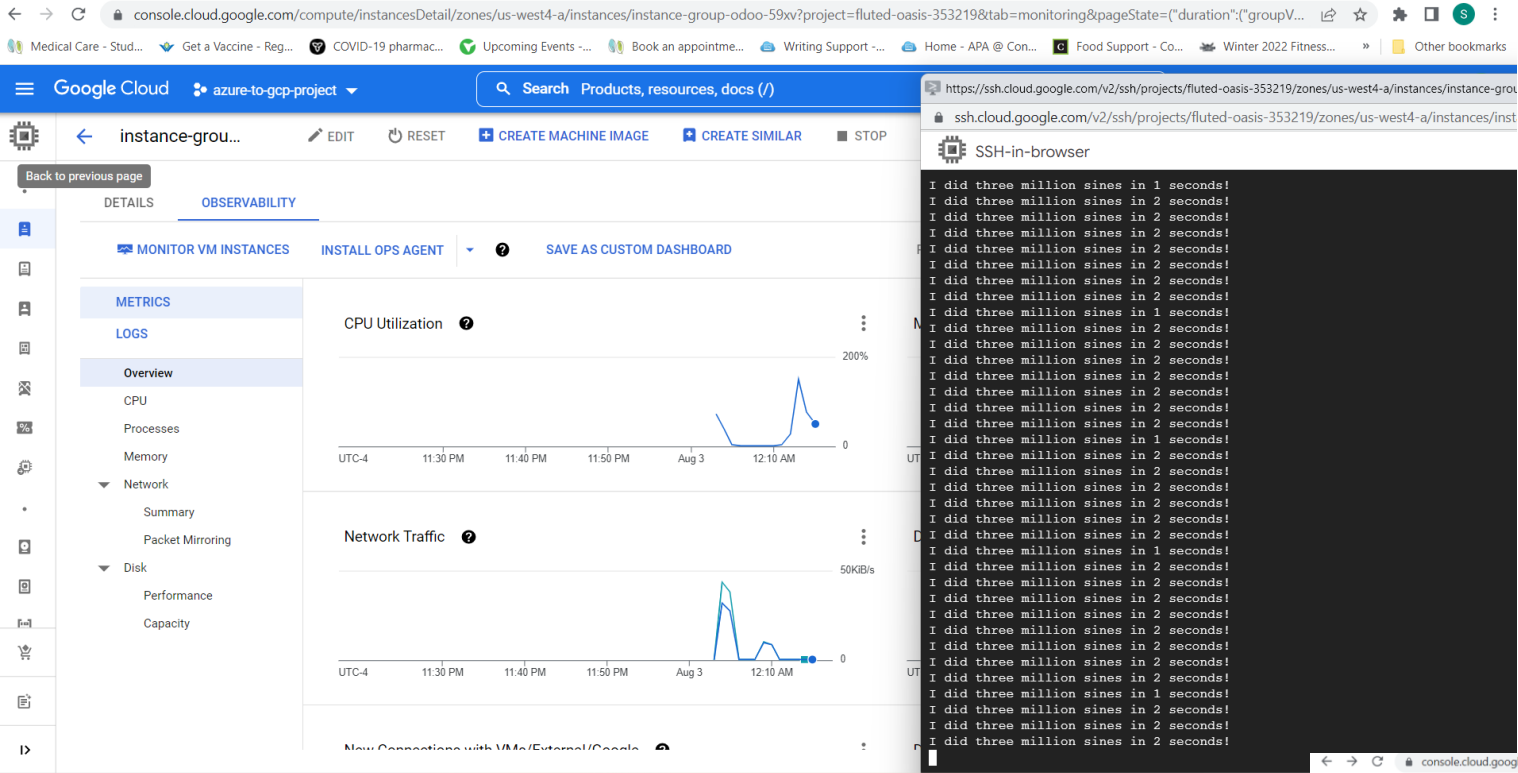


<input type="checkbox"/>	Status	Name ↑	Creation Time	Template	Per instance config	Internal IP	External IP	Health Check Status	Connect
<input type="checkbox"/>	✓	instance-group-odoo-59xv	Aug 2, 2022, 11:23:20 PM UTC-04:00	instance-template-odoo-2		10.2.1.5 (nic0)	34.125.235.223	✓ Healthy	SSH ▾

Filter Enter property name or value

<input type="checkbox"/>	Status	Name ↑	Zone	Recommendations	In use by	Internal IP	External IP	Connect
<input type="checkbox"/>	✓	instance-group-odoo-59xv	us-west4-a		instance-group-odoo	10.2.1.5 (nic0)	34.125.235.223 (nic0)	SSH ▾ ⋮
<input type="checkbox"/>	⦿	odoo-project	us-west4-a			10.2.1.4 (nic0)		SSH ▾ ⋮





5 Test instance group loading the CPU

Creation of 2 additional VMs
according to instance group rules

The screenshot shows the Google Cloud console interface for the 'instance-group-odoo'. The 'OVERVIEW' tab is selected, displaying a summary of the instance group. It shows 3 instances, all with a 'Ready' status and '100% healthy' health. The 'Autoscaling' section indicates that the group is configured with a minimum of 1 and a maximum of 3 instances. Below the summary, a table lists the 'Instance Group Members'.

Status	Name	Creation Time	Template	Per instance config	Internal IP	External IP	Health Check Status	Connect
Ready	instance-group-odoo-59xv	Aug 3, 2022, 12:02:24 AM UTC-04:00	instance-template-odoo-2		10.2.1.6 (nic0)	34.125.235.223	Healthy	SSH
Ready	instance-group-odoo-jd9d	Aug 3, 2022, 12:12:36 AM UTC-04:00	instance-template-odoo-2		10.2.1.7 (nic0)	34.125.118.161	Healthy	SSH
Ready	instance-group-odoo-p46k	Aug 3, 2022, 12:12:46 AM UTC-04:00	instance-template-odoo-2		10.2.1.8 (nic0)	34.125.5.36	Healthy	SSH

5 Load balancer test

console.cloud.google.com/net-services/loadbalancing/details/httpAdvanced/odoo-lb?project=fluted-oasis-353219

Medical Care - Stud... Get a Vaccine - Reg... COVID-19 pharmac... Upcoming Events ~... Book an appointme... Writing Support ~... Home - APA @ Con... Food Support - Co... Winter 2022 Fitness... Other bookmark

Google Cloud azure-to-gcp-project Search Products, resources, docs (/)

Load balancer details EDIT DELETE

Frontend

Protocol ↑	IP:Port	Certificate	SSL Policy	Network Tier ?
HTTP	35.244.199.166:80	-		Premium

Routing rules

Hosts ↑	Paths	Backend
All unmatched (default)	All unmatched (default)	odoo-backend

Backend

Backend services

1. odoo-backend

Endpoint protocol	Named port	Timeout	Health check	Cloud CDN	Logging
HTTP	http	30 seconds	odoo-healthcheck	Disabled	Disabled


ADVANCED CONFIGURATIONS


Name ↑	Type	Zone	Healthy	Autoscaling	Balancing mode	Selected ports ?	Capacity
instance-group-odoo	Instance group	us-west4-a	✓ 1 of 1	On: Target CPU utilization 60%	Max backend utilization: 60%	8069	100%

← → ↻ ⚠ Not secure | 35.244.199.166

Medical Care - Stud... Get a Vaccine - Reg... COVID-19 pharmac... Upcoming Events ~... Book an appointme... Writing Support ~... Home - APA @ Con... Food Support - Co... Winter 2022 Fitness... Other bookmark

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Paws and claws

ISSUES

Serverless connector

Cloud run doesn't allow attaching persistent volumes

PORT was a reserved word in GCP

Filter Enter property name or value					
<input checked="" type="checkbox"/>	<input type="radio"/>	Name ↑	Network	Subnet	IP address range
<input checked="" type="checkbox"/>	<input checked="" type="radio"/>	serverless-odoo-to-vpc	azure-to-gcp-vpc		10.8.0.16/28

Zone distance causes latency issues

Basic resources = Low performance

Kubernetes cluster connection

Learning curve

Cloud Run Deploy revision to odoo-project (us-west4)

Every change to the service configuration creates an immutable revision. A revision consists of a specific container image, along with other environment settings.

CONTAINER VARIABLES & SECRETS CONNECTIONS SECURITY

Environment variables

Name 1 HOST	Value 1 10.1.3.4
e.g. ENV	e.g. prod
Name 2 USER	Value 2 odoo
e.g. ENV	e.g. prod
Name 3 PASSWORD	Value 3 Secret55
e.g. ENV	e.g. prod
Name 4 G_PORT	Value 4 5432
e.g. ENV	e.g. prod

Detailed cost analysis

Resource	Monthly Cost	Annual Cost	Description
DB Compute Redundancy	\$329.80	3957.6	General purpose 1 year reserved 2vCore 10 GB Memory
DB Storage	\$5.696	68.36	32 Gb (Cost \$0.178 per month)
DB Backup	\$9.92	119.04	Geographically redundant \$0.310 GiB/month per 32 Gb
Compute Engine	\$55.0	\$660	e2-standard-2 2vCPUs 8 Gb \$55.0 per month
Storage	\$37.4	\$448.8	Regional SSD provisioned space - \$0.374 per GB – 100 GB
VPN GCP	\$297.28	\$3,567.36	<div>\$0.05 per hour / 720 hours per month</div> <div>Hourly charge for each tunnel attached to the gateway.</div> <div>2 tunnels for HA</div> <div>No charge for ingress and external IP</div> <div>Egress traffic = 2 TB (or 2,048 GB) x \$0.11 = \$225.28</div>
Azure Gateway	\$225.76	\$2,709.12	<div>Generation2 VpnGw4 5Gbps</div> <div>\$0.020/hour per tunnel / 720 hours = 14.4</div> <div>Egress traffic = 2 TB (or 2,048 GB) x \$0.1032 = \$225.28</div>
Load balancer	\$72.44	\$869.28	<div>\$0.025 per hour x 720 hours x 3 instances = 54</div> <div>Inbound data 2 TB (or 2,048 GB) x \$0.009 = 18.44</div>
CDN	\$44.00	\$528.00	<div>Cache egress: 500 GB cache egress * \$0.08 per GB = \$40.0</div> <div>Cache fill: 25 GB fill * \$0.01 per GB = \$0.25</div> <div>Cache lookup requests: \$0.0075 per 10,000 operations = \$3.75</div>
	\$1,077.30 CAD	TOTAL	12,927.56 CAD



SUMMARY

The implementation of hybrid solutions will enable the organization to scale its resources dynamically as the business grows, offering the security that customer data is stored securely in a private network.

These types of implementations are beneficial for many industry sectors that require certain data restrictions or just or simply have the certainty that the cloud is safe.

As for practice, it was very interesting to apply some of the knowledge acquired during the course and identify the large ecosystem of available resources that exist in the cloud to continue learning and take it to the next level.



WALL ST

THANK YOU