

### Overview

- Overview of the current landscape Prospective recession and businesses doing it tough
- Exploration of low to no cost IT services, including cloud infrastructure
- Scenarios where you can leverage free cloud infrastructure to keep your business afloat



### **Current Landscape**

- Worldwide post-pandemic
- Last 2 years pandemic bring business to a halt
- Not to mention world is in the brink of economic recession



### However cost is still rising

- Labour cost
- Infrastructure cost
- It's happening when business is struggling







### **Available Resources**

- Cloud VMs
- Cloud Storage (block storage, object storage)
- Public IP and ingress/egress traffic
- Domain Names (DNS records)
- TLS termination, PKI
- Cloud VPN

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### The Cloud Provider

- Big Cloud Provider
  - Amazon Web Services (AWS)
  - Google Cloud Platform (GCP)
  - Microsoft Azure
  - Oracle Cloud Infrastructure (OCI)
  - Alibaba Cloud
  - OVH

- Regional & Local Provider
  - Linode
  - Vultr
  - Digital Ocean
  - Biznet Gio
  - IDCloudhost
  - Etc.





### Purpose of this talk

- I will share my experience about using the free cloud infrastructure to lower cost of infrastructure
- I hope my experience will be useful for all of you to help you in this uncertain times

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### Disclaimer

- However you still credit card
  - Subscribe to cloud infrastructure requires valid credit card
  - Domain name (.com, .co.id, other ccTLD) annual subscription
- Some of this services may not be sufficient for your requirements
- Some of this services may not be available
  - Partially available, try again later, or try in another region
- Their T&C may have been changed
- · I'm not their business reps, nor ambassador
  - I'm not receiving any commission and fee for this talk





### Free Cloud Infrastructure

- Every cloud computing always gives "free trial"
  - But their trial is limited by time: free for 1 year, free for 1 month, etc.
  - After the trial, they expect you to start use their services
- After "free trial" period, this thing could happen:
  - Your free trial service is stopped, you lose access to your services
  - Your free trial is migrated to paid usage, you start receiving usage bills
  - Rather than enjoy the services, you will have "bill shock"
- Are there any alternatives on this?

### Free Cloud Infrastructure

- Oracle Cloud Infrastructure (OCI) has "Always Free" services
- After signup, you can use every services in "Trial mode" for 1 month
- After one month, you can keep continue use "Always Free" services
- No usage bills



### Type of services available (in one region)

- AMD (x86\_64) and ARM64 Compute VMs
- 200 GB total block storage
- 10 GB object storage
- 10 TB outbound data transfer per month
- 2 Autonomous Databases, 20 GB each
- 10+ more Always Free services





### OCI in APAC Regions

- Japan East (Tokyo)
- Japan Central (Osaka)
- South Korea Central (Seoul)
- South Korea North (Chuncheong)
- Australia East (Sydney)
- Australia Southeast (Melbourne)
- India West (Mumbai)
- India South (Hyderabad)
- Singapore (Singapore)



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### Compute VMs and Storage

### AMD (x86\_64) VM

- 1 vCPU, 1 GB RAM
- 50 GB storage

### Ampere (ARM64) VM

- 1-4 vCPU, 6-24 GB RAM
- 50 GB storage on each VM

### **Object storage**

- 10 GB Standard
- 10 GB Infrequent Access
- 10 GB Archive Storage

### **Block storage**

- 200GB combined storage/region
- 1 VM consume 50GB
- So you can only create 4 VM

# Virtual Networks & Security Networking Security • 10 TB outbound traffic • Security Group • 2 Virtual network (IPv4/v6) • Site-to-site IPSec VPN • 1 instance Load Balancer (10Mbps) • 5 private CA and 150 certificate • Bastion Host • 8 and 150 certificate



### Create your account

- Go to
   <u>https://www.oracle.com/</u>
   <u>cloud/free</u>
- Create account
- Enter your Credit Card information
- Usually works the first time







Create VM – Choose your shapes Processor types: - AMD (x86\_64) - Ampere (ARM64) ACLE Cloud Create compute instance Browse all shapes Another processor anomical Obuntu 24 • available but not Always-free legible AMD NM.S Intel Networking Virtual cloud netw Subnet: Public Sul ٥ Add SSH keys





### Other things to configure

- VM cleanup
  - Ubuntu ufw doesn't work well on OCI, use firewall-cmd instead
- Security list
  - Configure firewall to open port
  - SSH is open by default
  - Open port 80, 443, maybe 8443 or other
- Configure OCI using Terraform
  - Configure OCI as Infrastructure as Code (IaC)
  - Automatically provision resource in declarative language

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### Explore a bit more

- Your developer friend can setup Oracle APEX for free application hosting without using your precious free VM
- Use Object Storage and configure as file storage for your VM
- · Configure bastion host
  - But I prefer using Tailscale instead, will be explained later
- Configure load balancer and certificate
  - But I prefer using Cloudflare instead, will be explained right away





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### Configure your domain Create DNS records For your website, simply switch the "Proxy Status" to "Proxied" to activate TLS For other record, keep it switch to "DNS only"

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### SSL/TLS Configuration

Three types of TLS:

- Flexible: TLS with insecure HTTP origin
- Full: TLS with self-signed
   HTTPS origin
- Strict: Full with Cloudflare certificate



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Easy win – IPv6-enabled for your site					
	IPv6 Compatibility Enable IPv6 support and gateway. This setting was last changed a year ago				
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	<ul> <li>What is IPv6?</li> <li>As the Internet runs low on IPv4 address space, there's been a rapid increase in the deployment of IPv6 technologies. This shift is critical to the long-term growth and health of the Internet. At Cloudflare, we are doing our part to make it free and easy for all websites to be available on network.ipv6.</li> <li>What does enabling IPv6 compatibility do?</li> <li>The IPv6 gateway setting enables IPv6 on all subdomains that are on Cloudflare (marked by an orange cloud in your DNS settings). If your host provides IPv6 support, the gateway will proxy IPv6 connections through Cloudflare. When both IPv4 and IPv6 connections are available. Cloudflare prefers IPv4. We recommend keeping IPv6 Compatibility set to "On" for greater availability for your website.</li> <li>Note: If you already have IPv6 records on your origin server, you must enable Cloudflare for your AAAA records on the DNS settings page.</li> <li>Why can't I turn off IPv6?</li> <li>At Cloudflare we believe in being good to the Internet and good to our customers. By moving on from the legacy world of IPv4-only to the modern-day world where IPv4 and IPv6 are treated equally, we believe we are doing exactly that. In the Cloudflare dashboard, IPv6 is no longer something you can toggle on and off, it's always just on.</li> </ul>				
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### Tailscale Free Tier

- Zero-configuration VPN
- Can use your SSO (Google, Microsoft, GitHub, etc.)
- · Connecting any resources from anywhere

### :: tailscale



What Tailscale can do	
<ul> <li>Connecting resources anywhere to anyone:</li> <li>Windows desktop</li> <li>Windows Server</li> <li>macOS</li> <li>Linux (x86_64, arm64)</li> <li>iOS/iPadOS</li> <li>Android</li> </ul>	<ul> <li>Resources in:</li> <li>The Cloud (VMs): <ul> <li>AWS, Azure, GCP, OCI, etc.</li> <li>ANY VMs on the VPS</li> </ul> </li> <li>On-premises DC: <ul> <li>vSphere, Proxmox, KVM, etc.</li> </ul> </li> <li>On your home: <ul> <li>Raspberry Pi, NAS, PC under desk</li> </ul> </li> <li>Serverless: <ul> <li>GitHub Action, Google Cloud Run</li> </ul> </li> </ul>
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### Alternatives

- OpenVPN
- WireGuard VPN
- ZeroTier
- Nebula (from Slack)
- Cloudflare Zero Trust
- Why Tailscale: it's the easiest solution!



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### What's beyond cloud VPN

- Cloud subnet
  - Using Tailscale on Linux, function as subnet router
  - Connecting devices that cannot use Tailscale app: IP camera, IoT equipment

### • Exit nodes

- Using Tailscale on Linux, function as gateway router to Internet
- Whole user traffic will be redirected to exit nodes
- MagicDNS
  - Register domain names automatically for your nodes
  - Can use names to access server, not only using Tailscale-assigned IPs

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How USD\$0 cloud infrastructure can support your business

### Use Case Scenario

## Use Case – Hybrid Company (1) Company of 5 distributed IT workers Someone called for a new IT project It's their first project, so they need to create "company" Setup a company Get new domain name: company.com (pay annually) Get corporate email: developer@company.com using Zoho Mail Free (for 5 account) Get a collaboration system: Atlassian Cloud – JIRA, Confluence Free (for 10 account)

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### Use Case – Hybrid Company (2)

- Create resources on the cloud
  - AMD x86\_64 VM for small workload
    - Think Raspberry Pi 3 on the cloud
    - Maybe VPN server? Small web server?
  - ARM VM for medium workload
    - 6-12GB on VM will give you medium application server
    - Maybe small Kubernetes cluster
- Setup DNS and TLS termination
  - Deploy internet-facing workload
  - Can provision TLS certificate automatically



### Use Case – Hybrid Company (3)

- Client sometimes provide their own resources
  - Cloud VMs on their account
  - VM or baremetal from on-premises DC
- · Sometimes you want to access inside your home or office
  - Raspberry Pi lying around your home
  - Server with GPU under your desk
  - Prebuilt NAS (network attached server)
- Everything can be securely connected
  - Accessed just like in single LAN



### What can you have

- Company can have infrastructure at US\$ 0
  - VMs, storage, network, security in the cloud
  - CDN, DNS, and TLS
  - VPN to access any resources from any devices
- Also use free SaaS (software as a service)
  - Communication: Email, Chat, Wiki, Project management
  - Tools: Source code management, CI/CD
- Upgrade to paid infrastructure to scale up
  - But at least your basic infrastructure can run when you can't scale

### In the end

- Free cloud infrastructure and application allows you to gain benefit by reducing costs, allow your business to stay afloat
- Opportunities for everyone to setup virtual IT environment
  - Small to medium business to start business
  - Developer, startup CTO to start MVPs (minimum viable products)
  - Network, system administrator to setup development system
  - Etc.



