

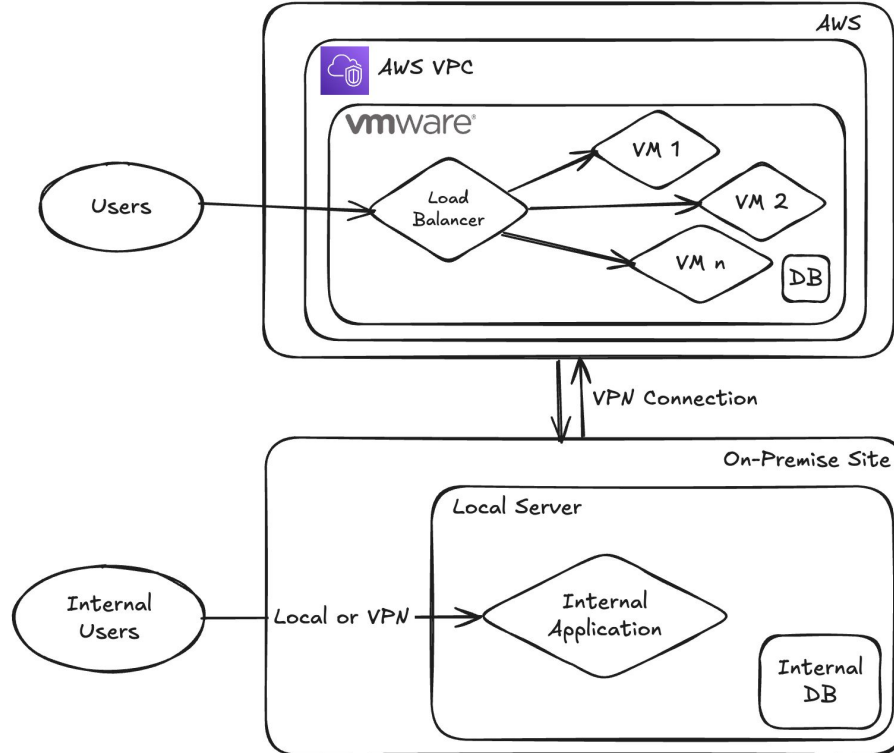


Multi-cloud and Hybrid cloud Architectures

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Reg Chula : Hybrid Architecture



Using VMWare to emulate SPARC and manage instances of VM taking care of legacy systems. We can then emulate network connection between each VM. The existing app should work seamlessly on AWS Cloud.

Backup can be done using AWS

On-Premise Site for Compliance Data

Sources: [Migrating Sun/SPARC Mission-Critical Applications from On-Premises to AWS Using SPARC Emulator](#) | [AWS Partner Network \(APN\) Blog](#)

Reg Chula : Pros & Cons



Pros

- Higher Uptime and better latency (when deployed on Thai data center)
- No need to manage legacy hardware, infrastructure such as switch, electricity, etc.
- Can scale easily

Cons

- Higher Cost in Long Term
- Vendor Locked-in

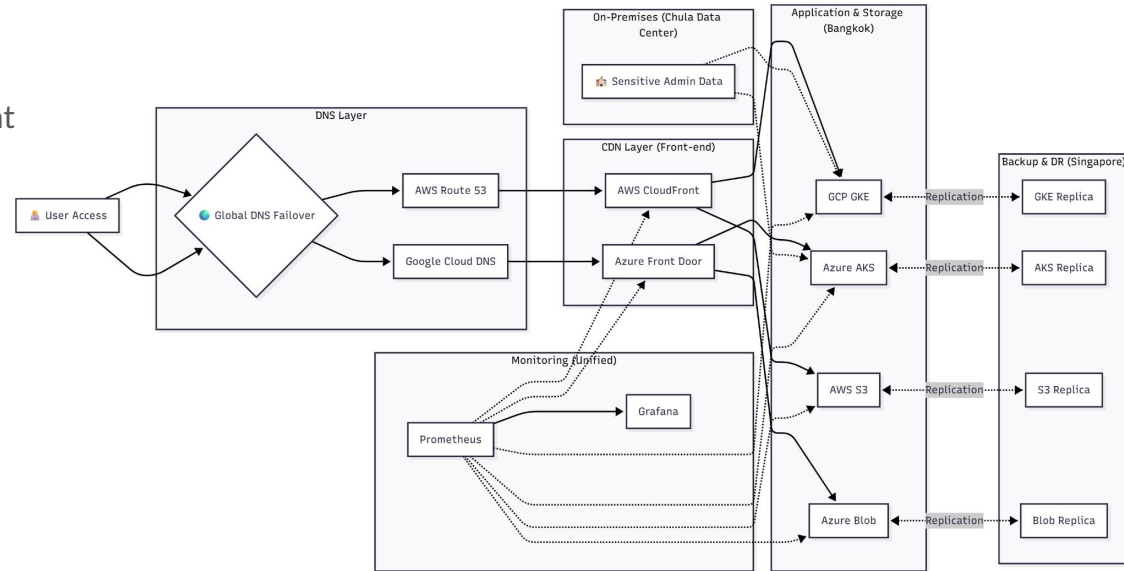
Long Term Solution

To fully benefit from cloud, the application, database, and overall architecture need to be redesigned to be Cloud-Native for efficiency and preventing Vendor Locked-in

www.chula.ac.th : Architecture

Type: Multi-cloud with Hybrid Edge

- **Front-end:** CDN (CloudFront and Azure Front Door) for global access
- **App layer:** Containerized microservices (GKE and AKS)
- **Static content:** Stored on S3 and Azure Blob
- **Load balancing:** Cross-cloud DNS failover (Route53 and Cloud DNS)
- **Monitoring:** Unified via Prometheus and Grafana across clouds
- **Backup & DR:** Replicated in multiple regions (e.g. Bangkok and Singapore)





www.chula.ac.th : Pro and Cons

Pros

- High availability: resilient to single-provider outages
- Global scalability with low latency via CDNs
- Vendor flexibility: avoid lock-in, optimize cost
- Security isolation: sensitive data stays on-prem

Cons

- Complex orchestration across clouds
- Higher management and monitoring overhead
- Cross-cloud data transfer costs
- Skill and policy alignment required

Remaining Shortcomings

- Still depends on external providers for uptime
- Network latency between clouds for real-time updates
- Compliance management complexity
- Harder troubleshooting in multi-cloud environments



www.chula.ac.th vs Reg Chula

www.chula.ac.th is much easier to design due to the app runs on modern architecture and has low complexity, only a static website, allowing it to be Dockerized and friendly for modern cloud.

On the other hand, Reg Chula relies on legacy systems making it hard to modularize it and contains highly sensitive information leading to more security and privacy concerns. Its performance need to be concerned as it receive more maximum server load from users during the peak registration periods.