Understanding Google Cloud Security and Operations

Cost management changes with Cloud

No more heavy capEx for IT infrastructure maintenance

OpEx in Cloud *spending Is monitored & controlled in ongoing basis*

Top pain points when managing cloud environment
- *unpredictable costs*
- *Lack of visibility*
- *transparency into Cloud Usage*

Finance Team VS Technology Team

struggle to keep up with cloud spend on daily, weekly or monthly basis

Don't factor cost in their decision making

To Solve this problem :

people

(various roles involved in managing cloud costs)

To merge cloud cost effectively, partnership across finance, technology and business functions is required

process

Technology

Visibility / Accountability
Control : Intelligence

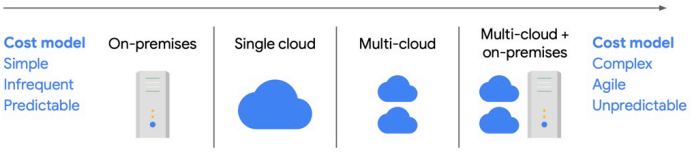
Google Cloud can bring its own tools to help organizations to help manage their costs.

Total cost of ownership for Cloud Services

Pay-as-you-go OpEx Model

** Cloud improves efficiency, reliability, security, greater productivity, Innovation for businesses*

Assessing IT total cost of ownership can vary depending on an organization's cloud adoption goals



When companies spent a substantial amount of money upfront to set up their IT structure, the capital expenditure would include paying of

- *Space & associated cost*
- *storage system*
- *Networking*
- *Hardware*
- *Software*
- *security system*

Core Google Cloud cost management concepts

1) Identify individual I team that will manage costs

2) Learn the difference between invoices and cost tools

3) Use cost management tools for accountability

Goals for cost management tools

= visibility, accountability, control, Intelligence

Central team can monitor current cost trends and identify areas of waste that could be improved using Google Cloud built-in reporting tools, and create custom dashboards to gain greater visibility into their costs. The pricing calculator allows an organization to see how changing usage will affect their costs

Best practices for effective cost management

Defining clear ownership for projects and sharing cost views with the departments and teams that are using Cloud resources will help us establish this accountability culture and more responsible spending. This team should use these tools to regularly identify and report on cost inefficiencies. In addition to making teams accountable for their spending,

With programmatic budget notifications, organizations can automate actions based on the unique requirements for your organization or industry.

Built-in reporting tools / Custom dashboards / Pricing Calculator

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Fundamental terms

privacy

refers to data an organization find Kilda I has access to and who they can share the data with

security

refers to policies, procedures, and controls put in place to keep data Safe

Compliance

Meeting standards set by a third party (3rd party can be regulatory authority, international standards organization)

availability

refers to how much time the cloud. service provider guarantees data and services are running Or accessible

Today's Cybersecurity challenges

Cyberattack threats

- Constant criminal attacks
- physical damage, i.e. data losses
- Malware attacks, viruses
- Unsecured third party systems
- Lack of expert knowledge

The shared responsibility model

Responsibility to secure data Is shared between business and cloud

Cloud Identity

Google Cloud solution that helps organizations control and manage access to resources in order to maintain the security and integrity of both data and system

"WHO" "CAN DO WHAT" "ON WHICH RESOURCE"

Google ↳ Primitive/Predefined/Custom

In Cloud environment, a project Is basis for enabling and using Google Cloud Capabilities, like managing APIs, enabling biting, adding and removing collaborators, and enabling other google services

Resource hierarchy

Refers to the Way IT team can organize business' Google Cloud environment and how that service Structure maps to your organization's actual structure.

With resource hierarchy, IT teams can manage access and permissions for groups f related resources

Understanding Google Cloud Security and Operations

Developers are responsible for writing codes for systems and applications, and operators are responsible for ensuring that those systems and applications operate reliably

→ Developers are expected to be agile. Their aim is to release new functions frequently, increase core business value with new features, and release fixes fast for an overall better user experience. In contrast, operators are expected to keep systems stable, and so they often prefer to work more slowly to ensure reliability and consistency.

For organizations to thrive in the cloud, they'll need to adapt their IT operations

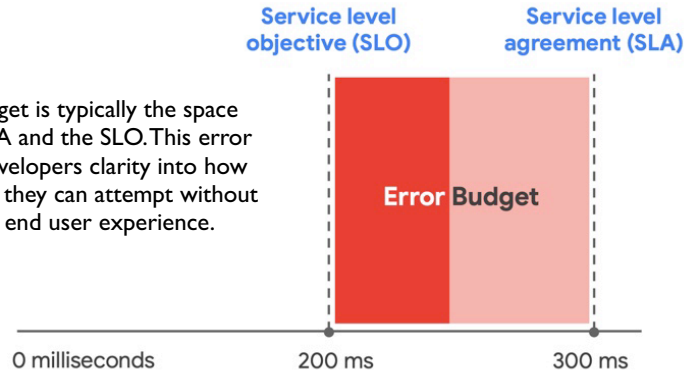
- Adjust expectations for service availability
- Adopt best practices from DevOps and site Reliability Engineering

Cloud providers use standard practices to define and measure Service availability for customers:

〈Standard Practice〉

- service level agreement → contractual agreement between Cloud service provider and customer 〈SLA provides the baseline level for the quality, availability, and reliability〉
- Service level objectives → Key element within SLA; the goal for the cloud service performance level, shared between CSP & customer → If service performance meets / exceed SLO, it means that end users, customers, and internal stakeholders are happy
- service level Indicator → Measure of the service provided → Includes reliability, latency and errors !

The error budget is typically the space between the SLA and the SLO. This error budget gives developers clarity into how many failed fixes they can attempt without affecting the end user experience.



DevOps or Developer Operations

A philosophy that seeks to create a more collaborative and accountable culture within developer and operations teams. The philosophy highlights how IT teams can operate, but doesn't give explicit guidance on how an organization should implement practices to be successful.

5 objectives of DevOps:
Reduce silos, Accept failure as normal, implement gradual change, Leverage tooling & automation, Measure everything

foundation for SRE → ✱ CLOUD MONITORING ✱

Site Reliability Engineering (or SRE)

A discipline that applies aspects of software engineering to operations. The goals of SRE are to create ultra-scalable and highly reliable software systems.

100% ⇒ 99.99...%