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Sertifikasi Dasar Google Cloud Computing Kelas A
You Can’t Secure the Cloud, Right?

- Security in the Cloud
  a. Fiver layers of protection = operational security, internet communication, storage services, service deployment, hardware infrastructure
  b. Hardware infrastructure layer
     - Hardware design and provenance = server boards and networking equipment in Google data center are custom designed by Google
     - Secure boot task = to ensure that they are booting the correct software stack
     - Premises security = Google designs and builds its own data center
  c. Service deployment layer
     - Encryption of inter-service communication = Google’s service communicate using remote procedure calls (RPC). Provides cryptography privacy and integrity
     - User identity = intelligently challenges users for additional information based on certain risk factors
  d. Storage services layer
     - Encryption at rest = most Google apps access file storage indirectly via storage services and encryption. Encryption is applied at the layer of these storage services
  e. Internet communication layer
     - Google front end (GFE) = ensure all registered services use TLS connections
     - Denial of service (DoS) protection = reduce any risk of any DoS impact on a service running behind GFE
  f. Operation security layer
     - Intrusion detection
     - Reducing insider risk
     - Employee universal second factor (U2F) use
     - Software development practices

- The Shared Security Model
    - Security responsibilities are shared between customers and Google cloud
    - When customer deploys an app to their on-premises infrastructure, they are responsible for the security of the entire stack
    - When they move an app to Google Cloud, Google handles many layer of security
    - Google Cloud provides tools that help them control this access, Identity and Access Management (IAM)

- Encryption Options
    a. Customer-managed encryption keys (CMEK)
        - Manage keys in a cloud-hosted solution
        - Encrypt and decrypt via API
        - Automated and at-will key rotation
        - Symmetric and asymmetric key support
    b. Customer-supplied encryption keys (CSEK)
        - More control, greater security management complexity
        - Responsible for storing the keys
    c. Persistent disk encryption with CSEK
        - Data is encrypted before leaves instance
        - System defined or customer supplied keys
    d. Client-side encryption = encrypt your data locally before store it in the cloud

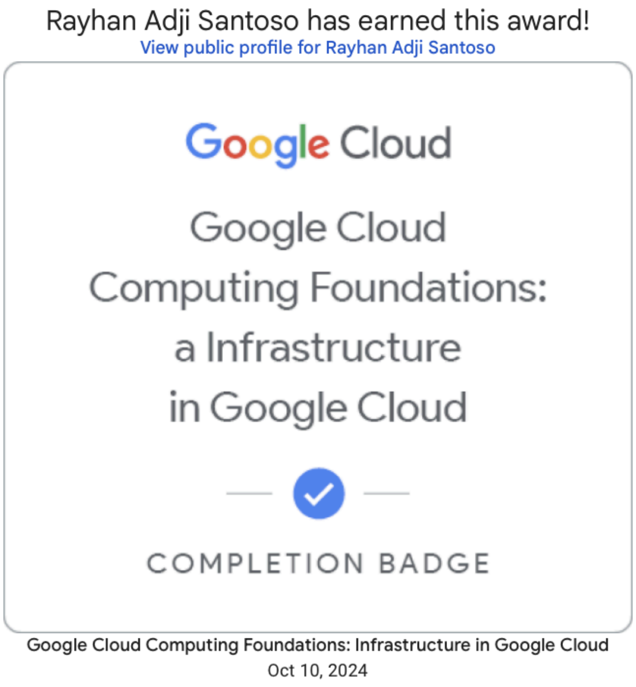
- Authentication and Authorization with IAM
    - Allow administrator to define who can access and apply policies
    - Role types = basic, predefined, custom
    - Cloud identity = menyederhanakan manajemen pengguna, dan akun layanan memungkinkan autentikasi aplikasi secara aman
    - Kebijakan IAM diterapkan secara hierarkis, sehingga memudahkan pengelolaan keamanan pada resources

- Lab: User Authentication: Identity-Aware Proxy
    - IAP is a resource that is used to set up authentication to http-based applications
    - Only users and groups can access apps and resources protected by IAP
    - IAP performs authentication and authorization

  Pada lab ini, saya diajarkan cara mendeploy app dan memproteksi menggunakan IAP (restrict access). Diajarkan juga cara menggunakan cryptographic verification.

- Lab: Cloud IAM: Qwik Start
  Pada lab ini, saya diajarkan cara assign role pada second user dan remove assigned roles, membuat Cloud Storage bucket, dan remove project access

- Quiz
  1. When a customer moves an application to Google Cloud, which one of the following does the customer remain responsible for?
     Data security
  2. Which IAM role is the most broad in scope?
     Basic
  3. At which level of Google Cloud's infrastructure security will you find intrusion detection?
     The operational security system
  4. With which encryption option does a customer encrypt data before sending it to Google Cloud?
     Client-side encryption



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Google Cloud Computing Foundations: Infrastructure in Google Cloud

Oct 10, 2024