Google Cloud

Special Briefing for Wantiknas on Data Center Integration - A Hybrid Approach

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What are some considerations for a Government Digitalization Strategy?

- **Resilience and Scalable:** How do we ensure an infrastructure that can meet growing and spikes in demands - that it is built to adjust?

- **Security:** How do we ensure that data is protected no matter where it is stored and that only the right people have access to it while ensuring that appropriate data is shared within the government for innovation and efficient policymaking?

- **Costs:** How do we deploy at a reasonable cost for taxpayers, so they are paying only for what's needed, but not more?

- **Interoperability:** How do we ensure that there's maximum flexibility to avoid lock-in with a vendor / provider?

- **Workforce training:** How do we use the strategy to develop the talent of the country?

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Innovative Governments Have a Framework for Hybrid/Multi-Cloud
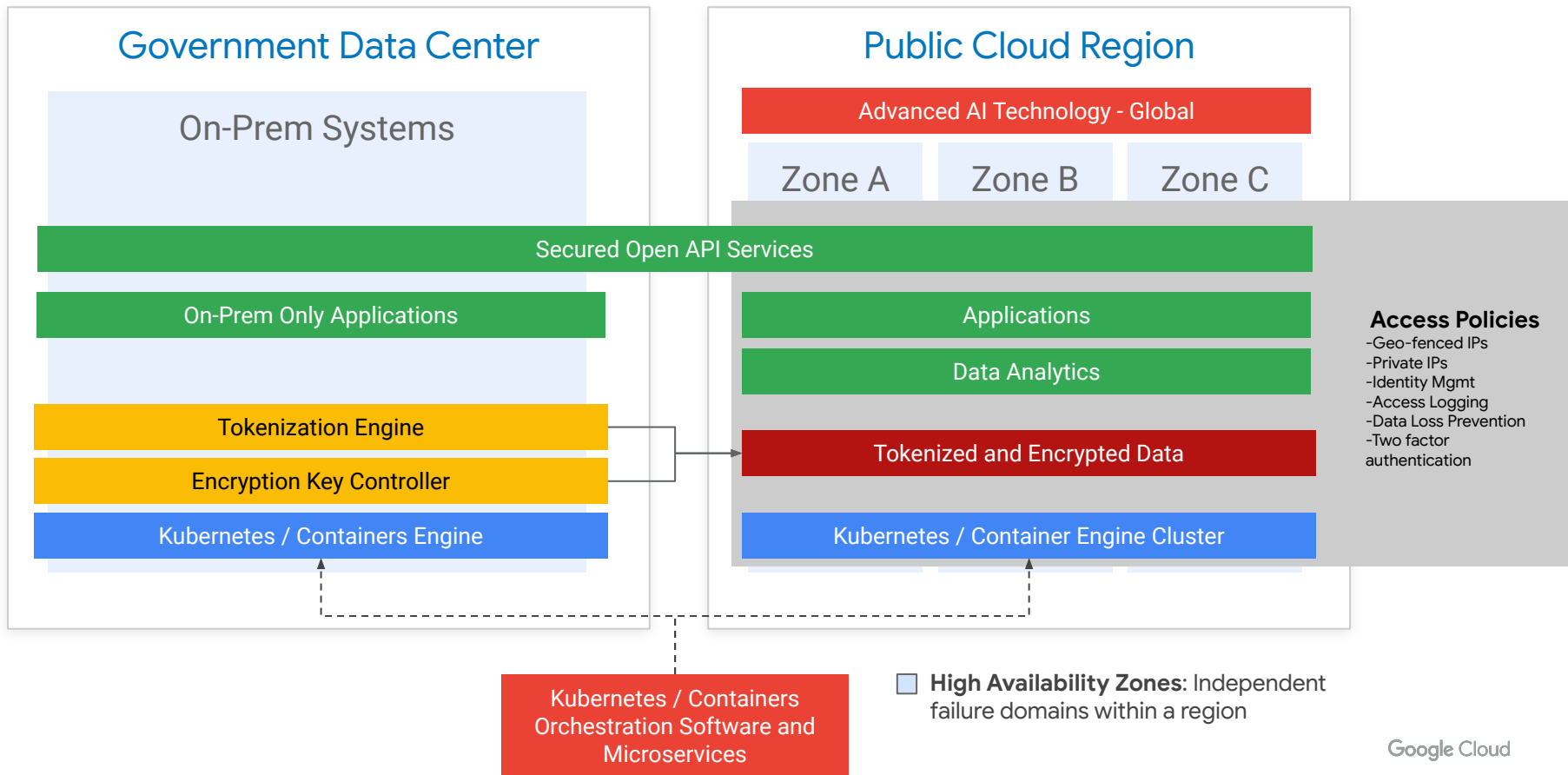
Select Countries

- **United States** - [Federal Cloud Computing Strategy - Cloud Smart](#)
- **United Kingdom** - [One Government Cloud Strategy](#)
- **Singapore** - [Government Commercial Cloud Infrastructure](#)
- **Australia** - [Secure Cloud Strategy](#)
- **Philippines** - [Cloud First Policy](#)

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## Common Policy Characteristics

- **Public Cloud is key:** All leverages the public cloud for technology, cost, and security benefits
- **Cloud-First Policy:** Default to build on the public cloud; on-prem is an exception
- **Data Classification:** Clarify how different types of data is handled; not necessarily data residency, but encryption and greater controls
- **Lead Transformation Agency:** A 'digital transformation' agency to drive change by example and across government
- **Security Requirements:** Leverage international standards; certify platform/products, not workloads to speed up adoption
- **Procurement:** Clear procurement processes to provide pricing transparency and flexibility to agencies
- **Workforce training:** Programs to upskill, retrain, and recruit talent

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High-Level Framework for Hybrid Development

Government Data Center

On-Prem Systems

Secured Open API Services

On-Prem Only Applications

Tokenization Engine

Encryption Key Controller

Kubernetes / Containers Engine

Public Cloud Region

Advanced AI Technology - Global

| Zone A | Zone B | Zone C |

Applications

Data Analytics

Tokenized and Encrypted Data

Kubernetes / Container Engine Cluster

Access Policies
-Geo-fenced IPs
-Private IPs
-Identity Mgmt
-Access Logging
-Data Loss Prevention
-Two factor
authentication

Kubernetes / Containers Orchestration Software and Microservices

High Availability Zones: Independent failure domains within a region

Powered by **Kubernetes**, Anthos lets you build and manage modern **hybrid and multi-cloud** applications with 100% software solution and no hardware lock-in

Build once, to run anywhere, across your existing on-premise infrastructure via VMware or Bare Metal; on all major public cloud providers; and at the Edge (telcos)

Anthos

Hybrid cloud

Multi-cloud

Mobile edge cloud
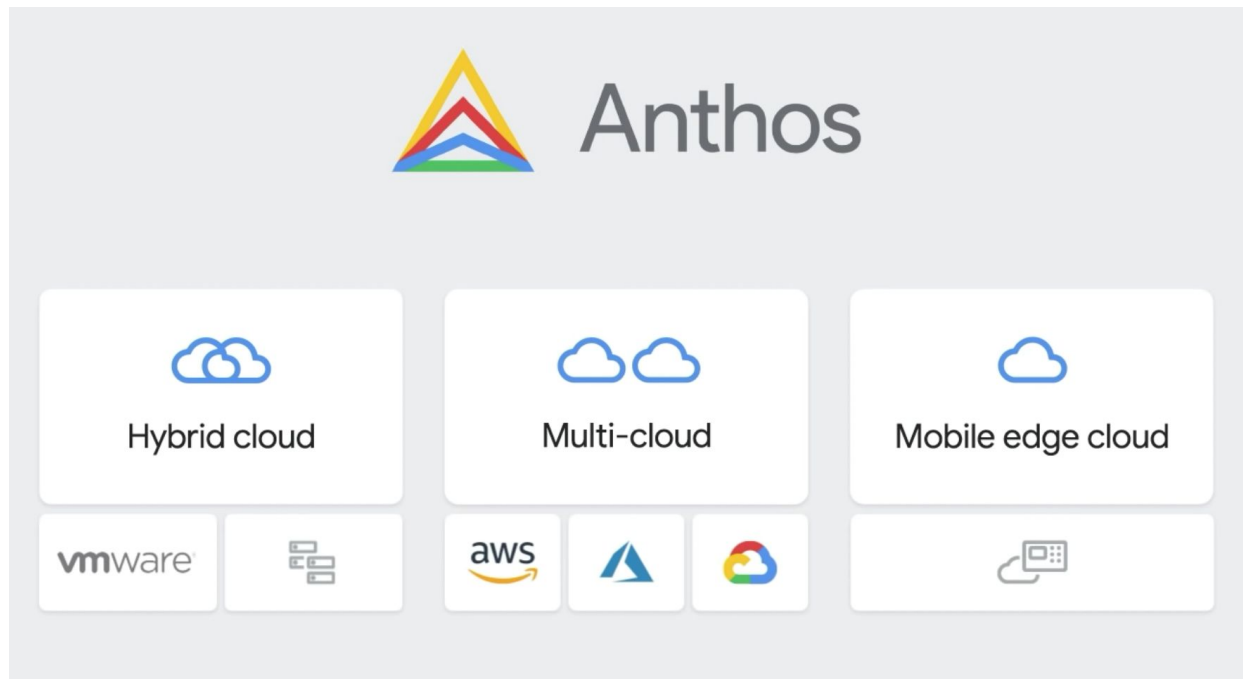
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XL Axiata Partners with Google Cloud to Advance Digital Transformation Strategy & Serve Customers in Indonesia

Adopts Google Cloud for hybrid-cloud; launches Google Cloud Partner Interconnect Service to connect Indonesian businesses to Google's global network infrastructure

Jakarta, Indonesia, 9 June 2020 – PT XL Axiata Tbk and Google Cloud today announced two strategic partnership initiatives to further the telecommunications leader's digital transformation journey as well as serve the evolving needs of millions of companies across Indonesia's rapidly digitizing economy.

Advancing XL Axiata's hybrid-cloud strategy with Anthos

With a target to move 70% of workloads to the cloud within the next three years, XL Axiata has adopted Anthos-Google Cloud's modern application management platform, to automate, manage and scale workloads across its hybrid- and multi-cloud environments in a secure, consistent manner.
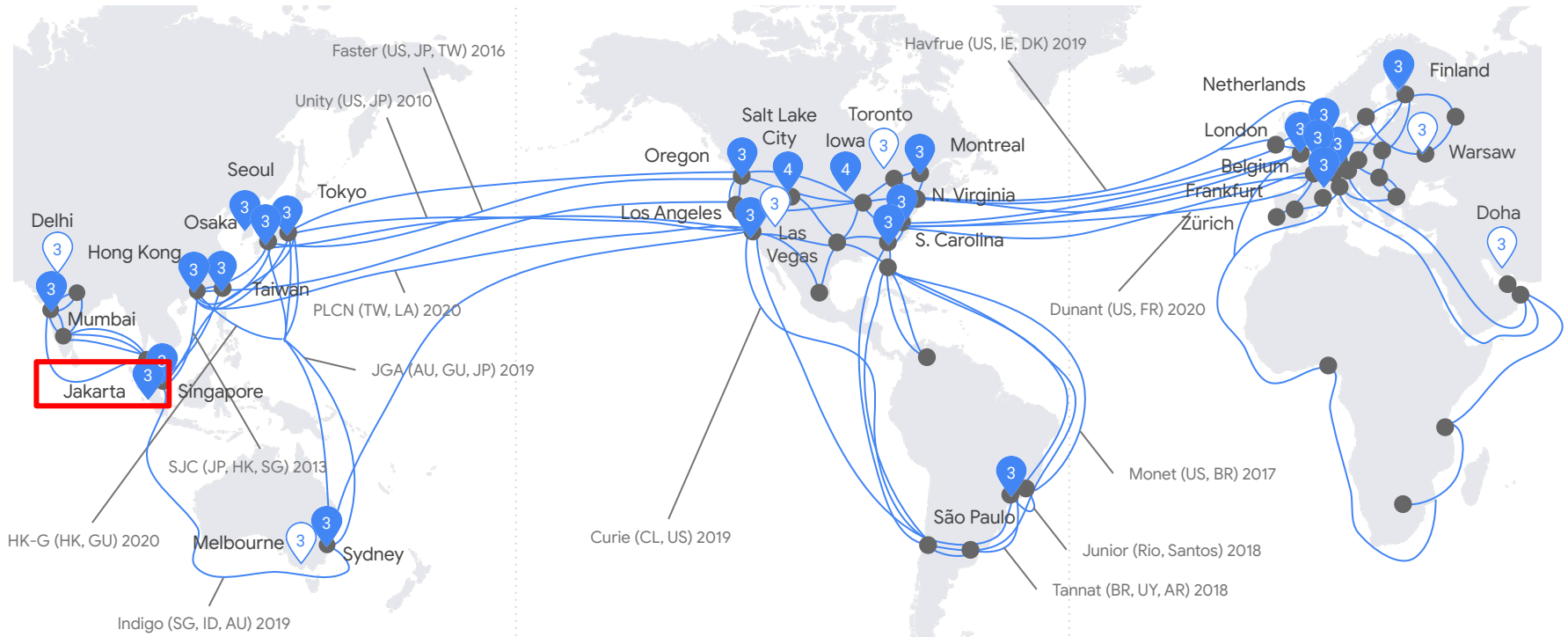
Google Cloud Anthos enables enterprises to build and manage Kubernetes-based applications, without modification, whether they are on existing on-premises data centers, Google Cloud or other clouds.

By migrating its microservices platform to Google Cloud and bringing Anthos Google Kubernetes Engine (GKE) to its on-premises data centers, XL Axiata can extend its cloud capabilities across its on-premises and cloud-based resources in a cost effective manner.

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Terima Kasih!

Appendix

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Operate services on a **purpose built network**

Legend:
- Current region and number of zones
- Future region and number of zones
- Edge points of presence 125+
- Network

Asia Pacific: Delhi 3, Hong Kong, Seoul, Osaka 3, 3, 3, Tokyo, Taiwan, Mumbai 3, Jakarta 3, Singapore, Melbourne 3, Sydney

Americas: Oregon, Salt Lake City 3, Iowa 4, Toronto 3, Montreal 3, Las Vegas, Los Angeles 3, 3, N. Virginia 3, 3, S. Carolina 4, São Paulo 3

Europe, Middle East, & Africa: Netherlands, London, Belgium, Frankfurt, Zürich 3, 3, 3, 3, Finland 3, Warsaw 3, Doha 3

Faster (US, JP, TW) 2016
Unity (US, JP) 2010
Havfrue (US, IE, DK) 2019
PLCN (TW, LA) 2020
JGA (AU, GU, JP) 2019
SJC (JP, HK, SG) 2013
HK-G (HK, GU) 2020
Indigo (SG, ID, AU) 2019
Curie (CL, US) 2019
Monet (US, BR) 2017
Junior (Rio, Santos) 2018
Tannat (BR, UY, AR) 2018
Dunant (US, FR) 2020
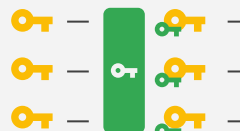
Asia Pacific | **Americas** | **Europe, Middle East, & Africa**
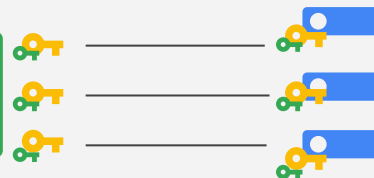
G|GAPP

Encrypt data
by default

Connections require TLS
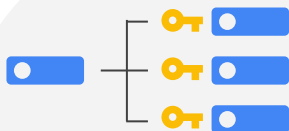
Data is chunked and each chunk is encrypted with its own data encryption key
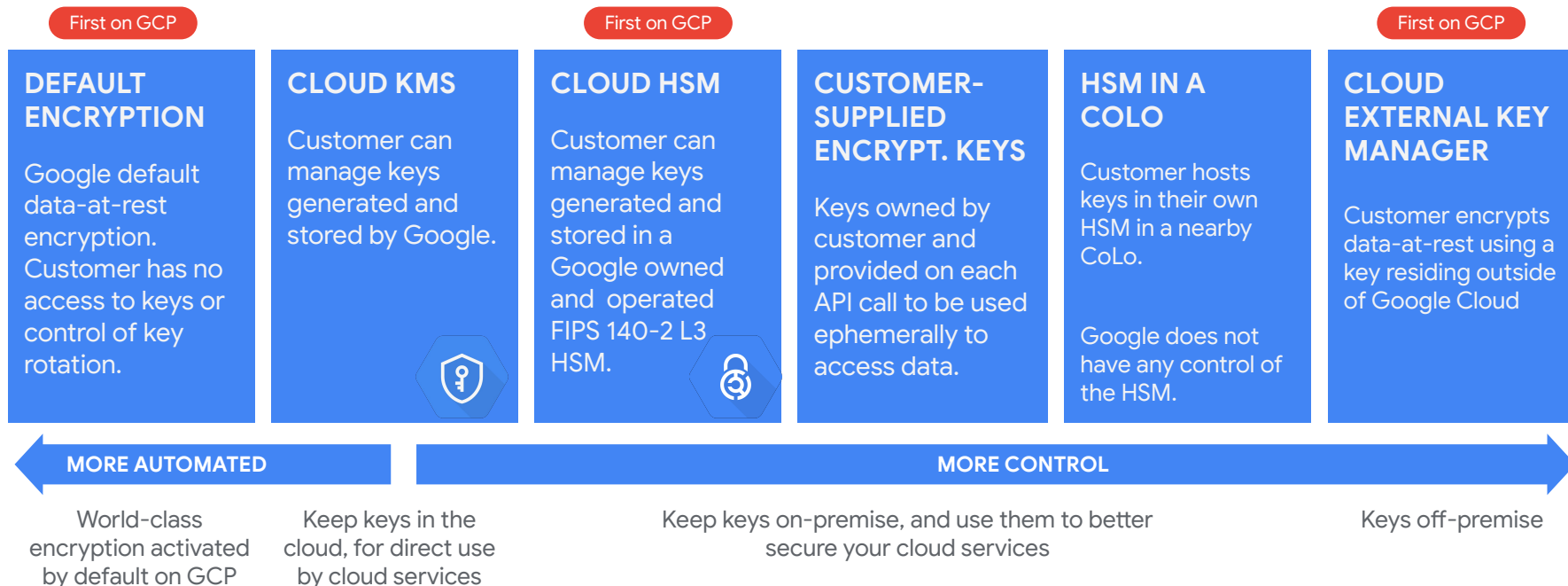
Data encryption keys (DEKs) are wrapped using a key encryption key (KEK)

Encrypted chunks and wrapped encryption keys are distributed across Google's storage infrastructure

Encryption Options on GCP

First on GCP

First on GCP

First on GCP

DEFAULT ENCRYPTION

Google default data-at-rest encryption. Customer has no access to keys or control of key rotation.

CLOUD KMS

Customer can manage keys generated and stored by Google.

CLOUD HSM

Customer can manage keys generated and stored in a Google owned and operated FIPS 140-2 L3 HSM.

CUSTOMER-SUPPLIED ENCRYPT. KEYS

Keys owned by customer and provided on each API call to be used ephemerally to access data.

HSM IN A COLO

Customer hosts keys in their own HSM in a nearby CoLo.

Google does not have any control of the HSM.

CLOUD EXTERNAL KEY MANAGER

Customer encrypts data-at-rest using a key residing outside of Google Cloud

◄ MORE AUTOMATED

MORE CONTROL ►

World-class encryption activated by default on GCP

Keep keys in the cloud, for direct use by cloud services

Keep keys on-premise, and use them to better secure your cloud services

Keys off-premise

Digital Transformation journey on Google Cloud

Start here, then build a customized journey

Transform with Google

Transformation partnership program (strategy and planning for entire journey)

Set up your GCP foundations and infrastructure

Security, admin, IAM, network, monitoring, billing, IaaS.

Accelerate organization transformation

Modernize Operating Model

Cloud operating model, CCOE, Adoption

Transform Workforce

Digital talent, change mgmt, training, culture

Adopt key capabilities

SRE, Innovation, Data driven organization

Modernize applications

Establish app dev foundations

Essentials for cloud native development and modernization, CI/CD, etc

Scale up modern app dev capabilities

Developer centric code delivery, cloud native, and modernizing legacy applications

Operate & optimize - DevOps for app operators

Apply DevOps best practices to custom solutions, integrations, and managed services

Modernize infrastructure

Set up cloud operations

Security, service mgmt, operations, and talent development

Migrate VMs

Inventory, app assessment and workload migration

Integrate hybrid solutions

GKE On-Prem, Stackdriver, Anthos

Produce actionable insights

Set up data platform & foundations

Integrate sources, data lifecycle, and governance

Migrate data

Assess, develop transforms, modernize EDW/DB

Build data & analytics solutions

Scale EDW/DB, IoT, cloud 4 marketing

Innovate with AI

Build Custom AI solution

Assess feasibility, build and train the model training, and develop, and productionize ML

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Example of Creating a Kubernetes Cluster in a Specific Region

Example of Services that Store Customer's Data at Rest Only in a Chosen Region