

Cloud Computing Pros and Cons





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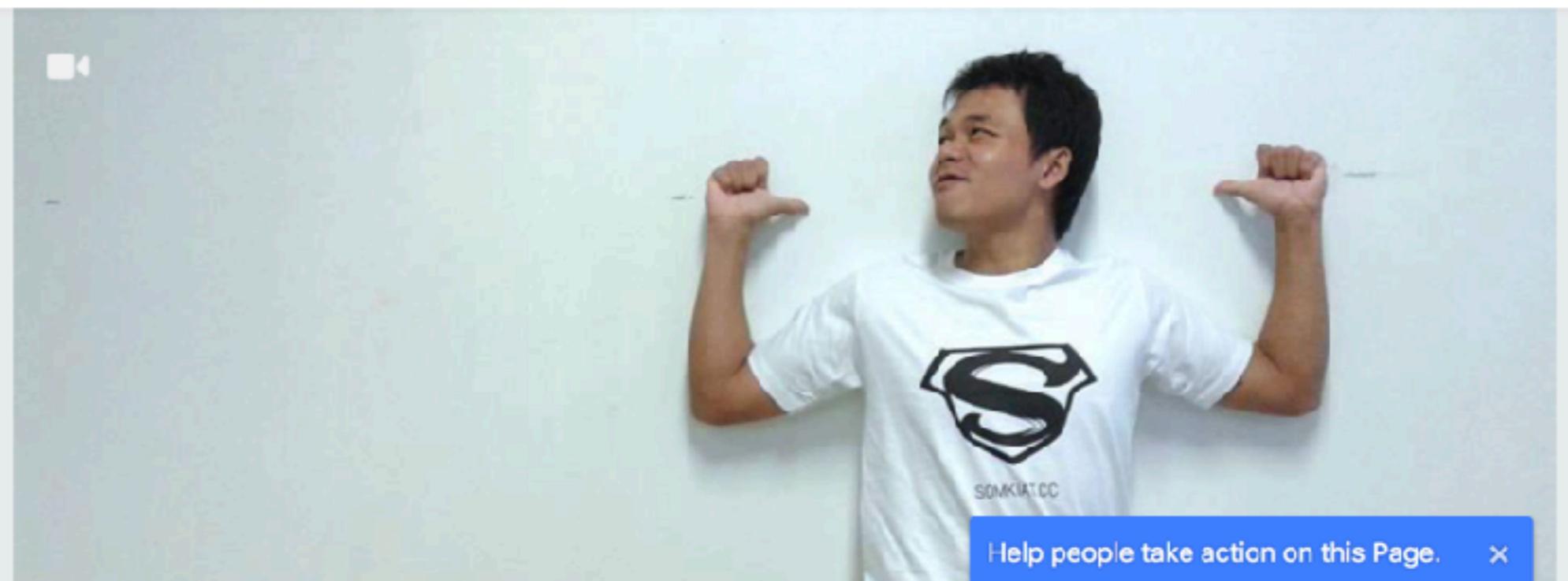
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Topics

Introduction to Cloud
Types of Cloud
Cloud models
Myths and concerns with Cloud
Pros and cons



Introduction



History of Cloud computing



History of Cloud

1950s

1969

1970

Mainframe

ARPANET
Internet

Virtualization
Software



History of Cloud

1950s

1969

1970

Mainframe

ARPANET
Internet

Virtualization
Software

On-premise infrastructure



History of Cloud

1950s

1969

1970

1997

Mainframe

ARPANET
Internet

Virtualization
Software

Cloud
computing

On-premise infrastructure



History of Cloud

1950s

1969

1970

1997

Current

Mainframe

ARPANET
Internet

Virtualization
Software

Cloud
computing

Public
Private
Hybrid

On-premise infrastructure

Adoption and migration



On-premise infrastructure



On-premise infrastructure

Computing resources that hosted in-house
Managed by and org's internal IT team

Physical server

Virtualization

Network hard ware

Storage

Managed by IT team (maintenance, upgrade, monitoring)



Pros

Full control (complete ownership and customization)

On-time cost (upfront investment)

Compliance and regulation control

Security (physical and data privacy)

No-internet dependency for internal system



Cons

High initial cost

Requires continuous investment in hardware upgrades and maintenance

Limited scalability (physical and space constraints)

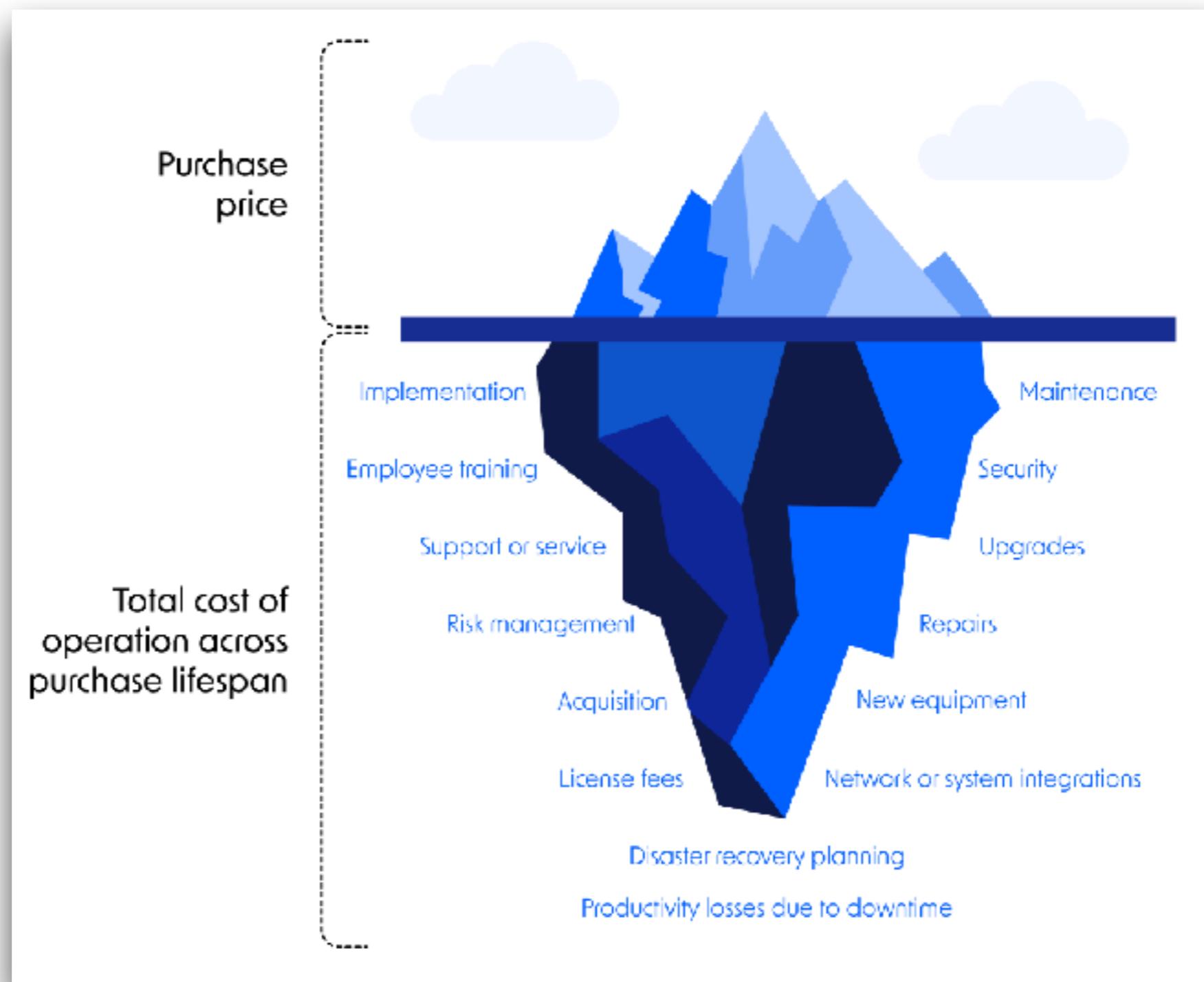
Maintenance responsibility

Disaster recovery (complex to setup)

Accessibility from outside (can't work without VPN)



Total Cost of Ownership



Cloud Computing



Try to solves On-premise Limitations

Scalability

Cost saving

Reduce
maintenance

Flexibility

Build-in disaster
recovery



Cloud Computing

Allow organization to access IT resources over internet

Pay-as-you-go in basis

Computing

Storage

Database

Network

Cloud providers manage the underlying **hardware** and perform maintenance, software patches, and updates

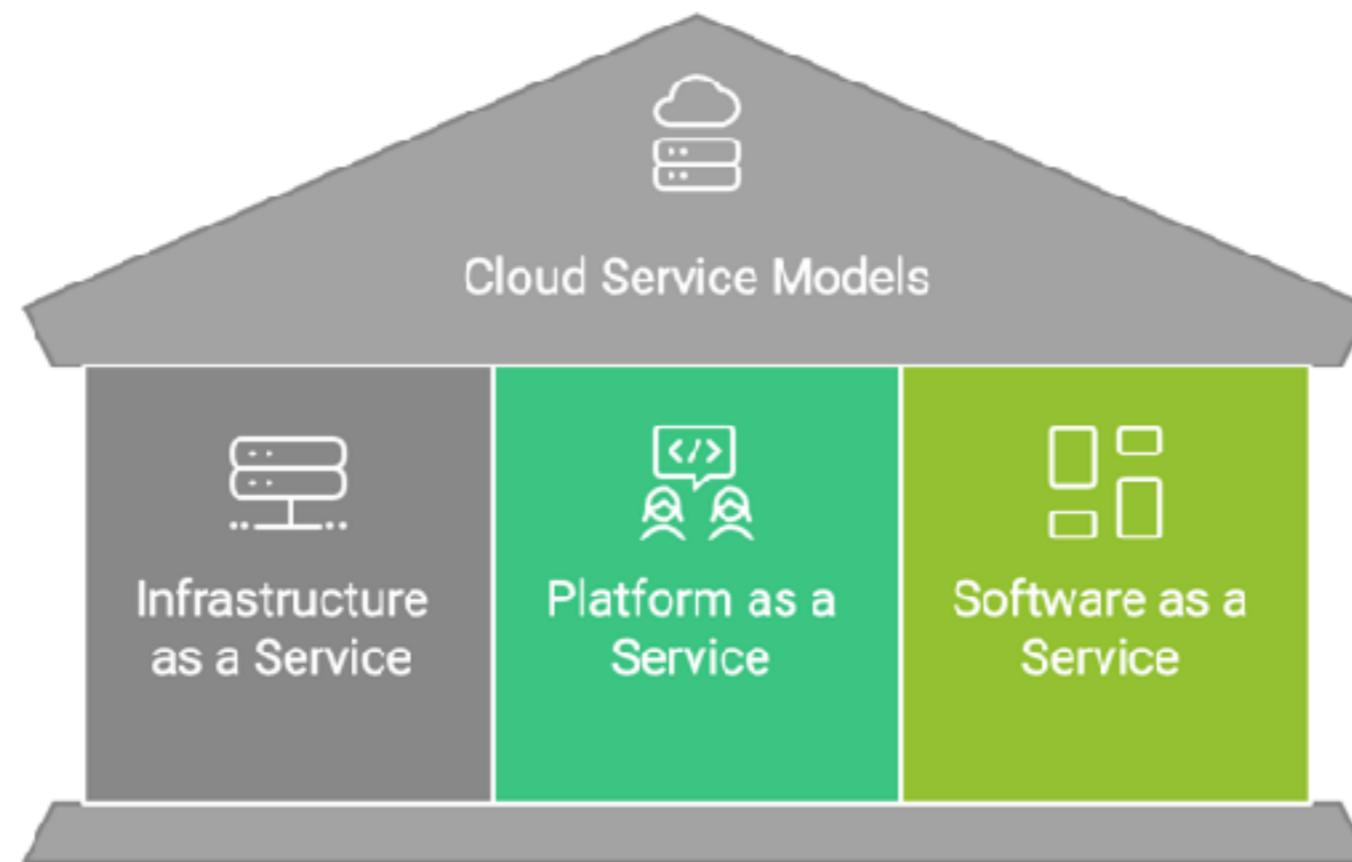


Service models of Cloud

Infrastructure as a Service (IaaS)

Platform as a Service (PaaS)

Software as a Service (SaaS)



IaaS

Provide virtualized computing resources over internet

Virtual
machine

Storage

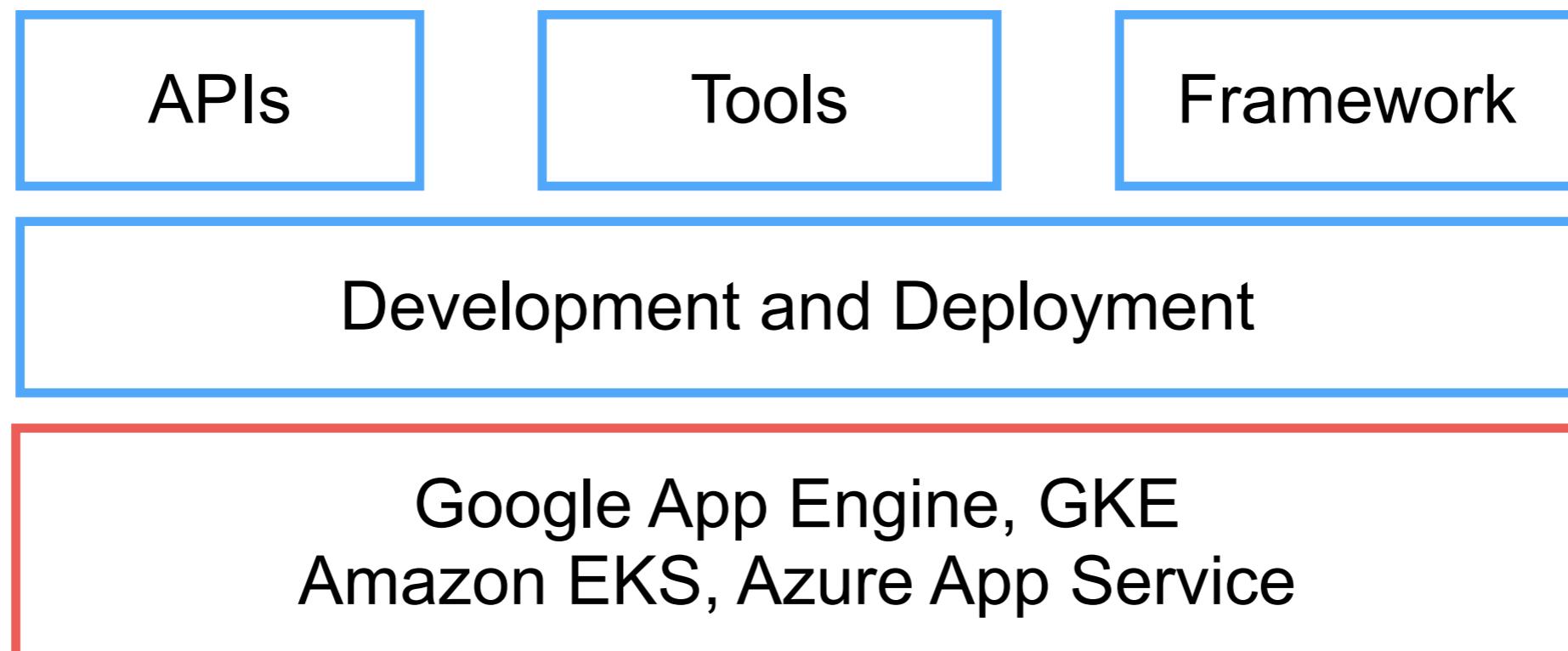
Networking

AWS, GCP, Azure



PaaS

Platform allow customer to develop, run, manage app without worry about infrastructure



SaaS

Provide access software app from internet

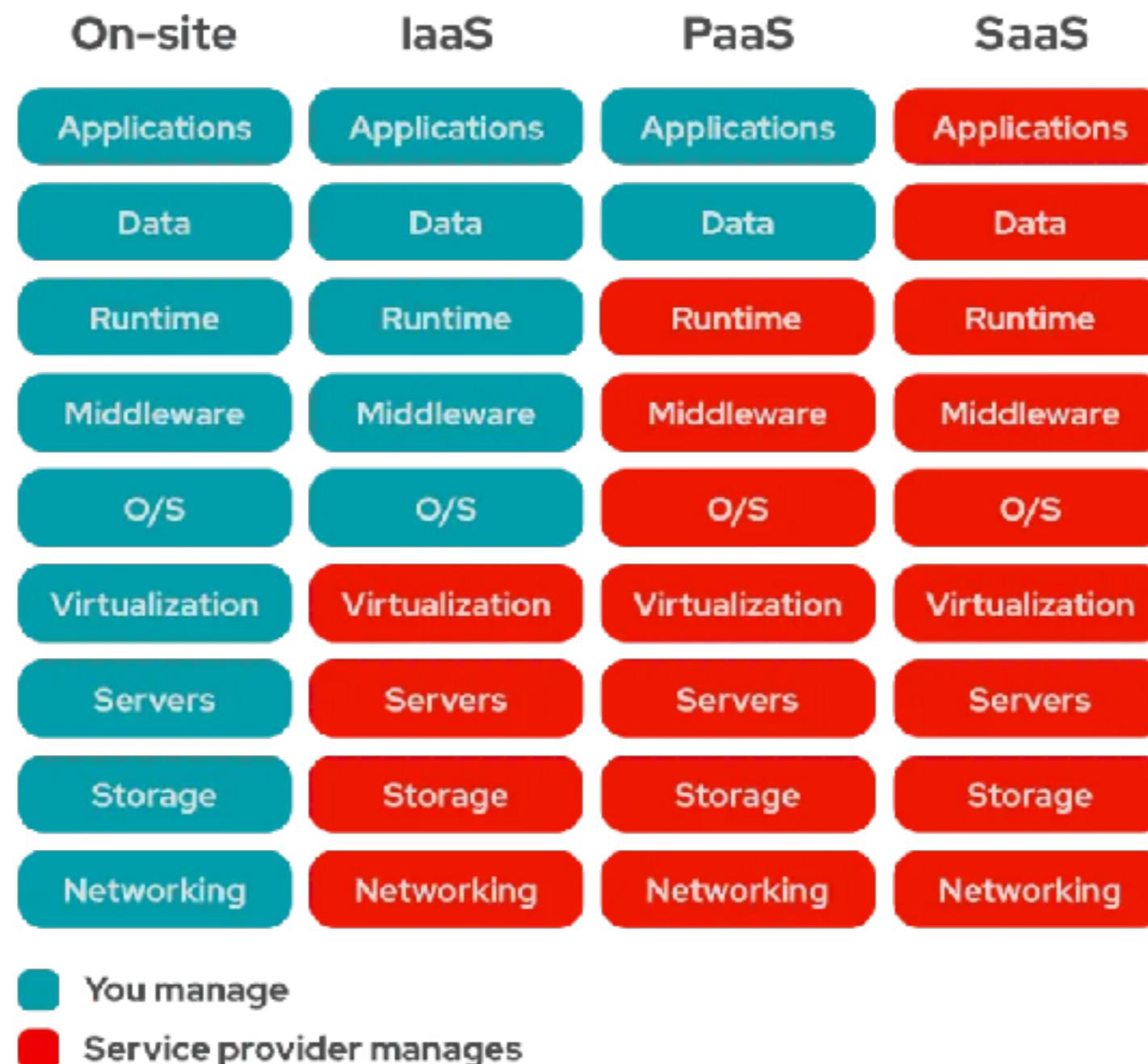
User can access via web browser without managing infrastructure or platform

Softwares

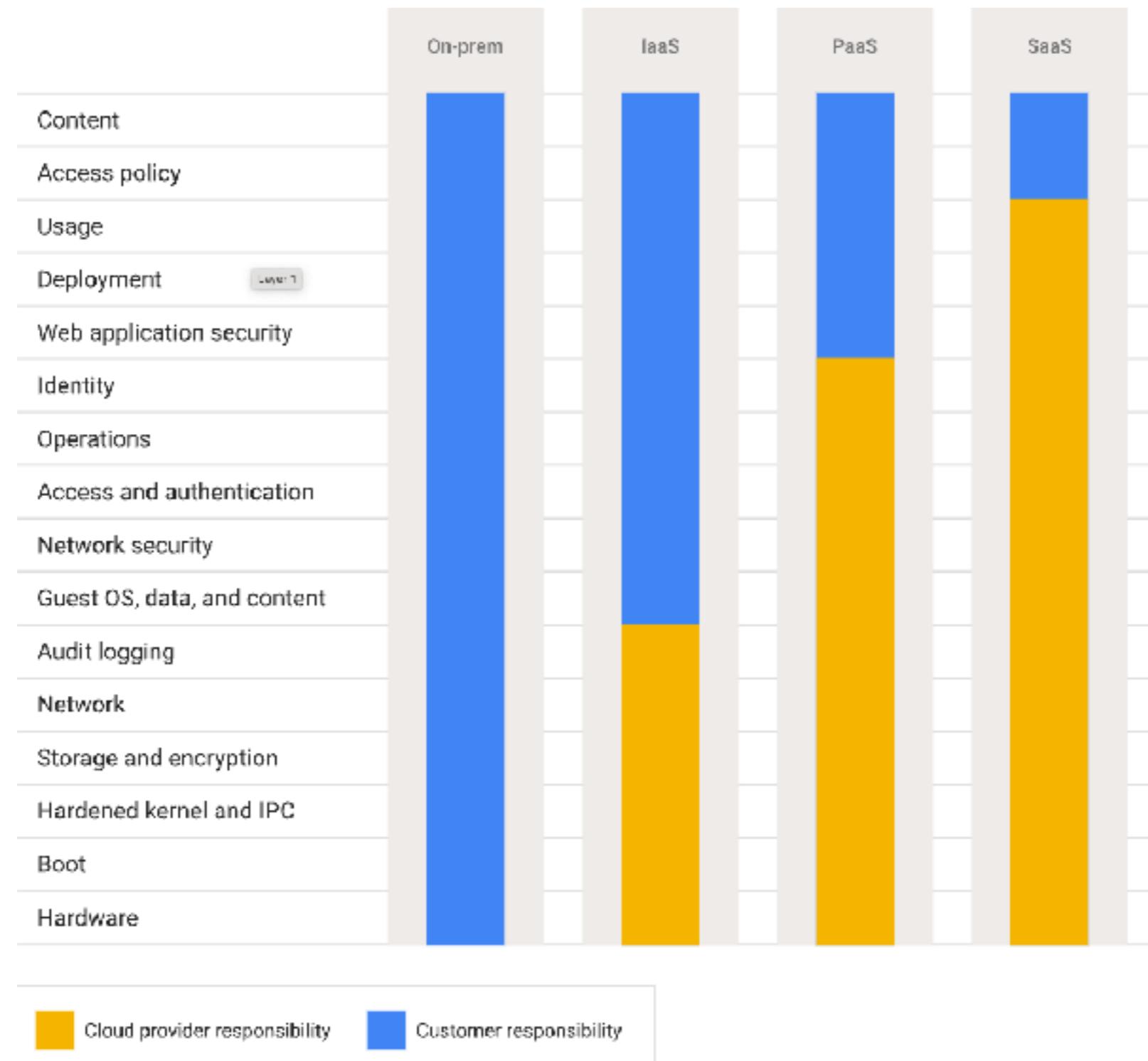
Google workspace, Microsoft 365, Salesforce



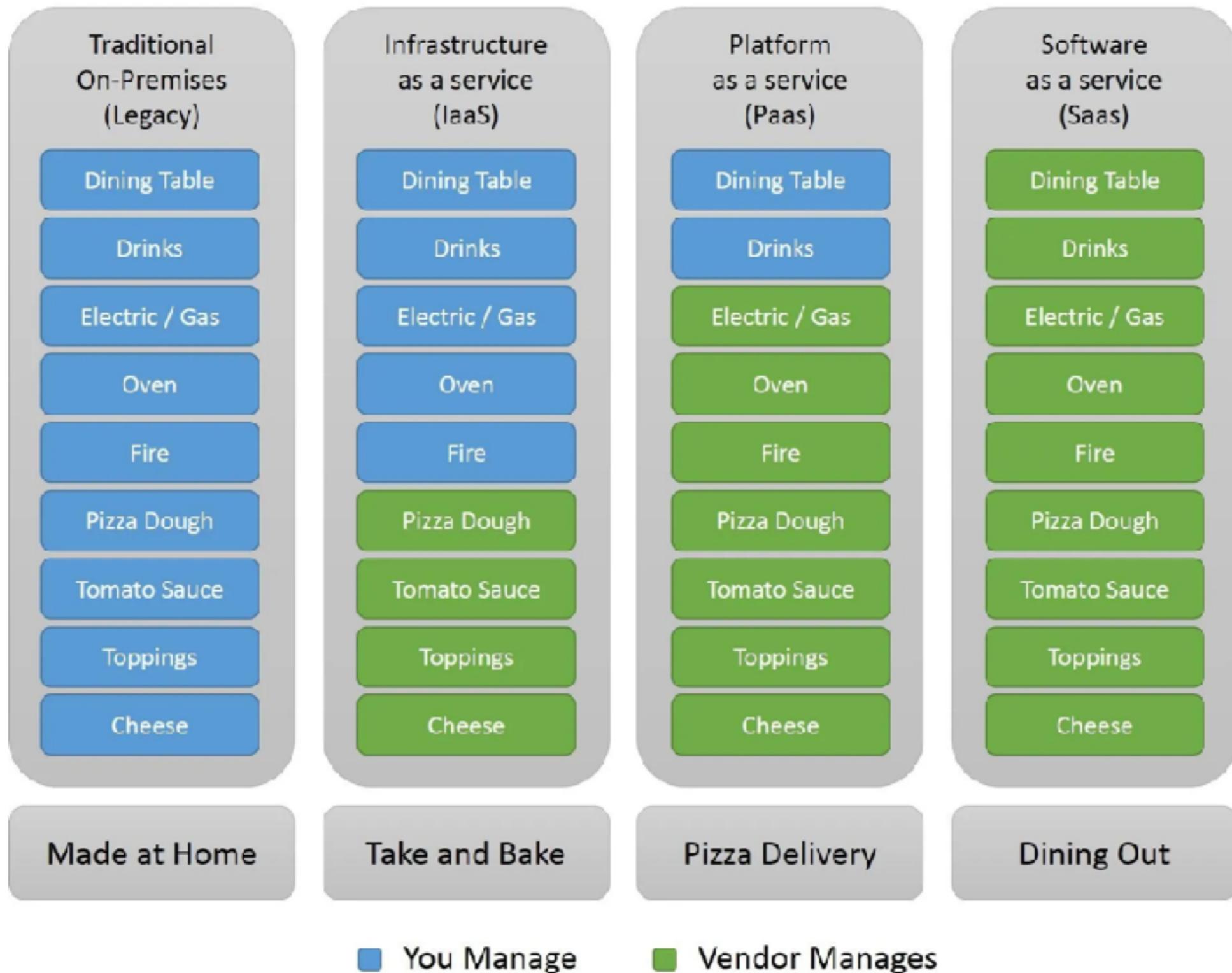
Service models of Cloud



Service models of Cloud



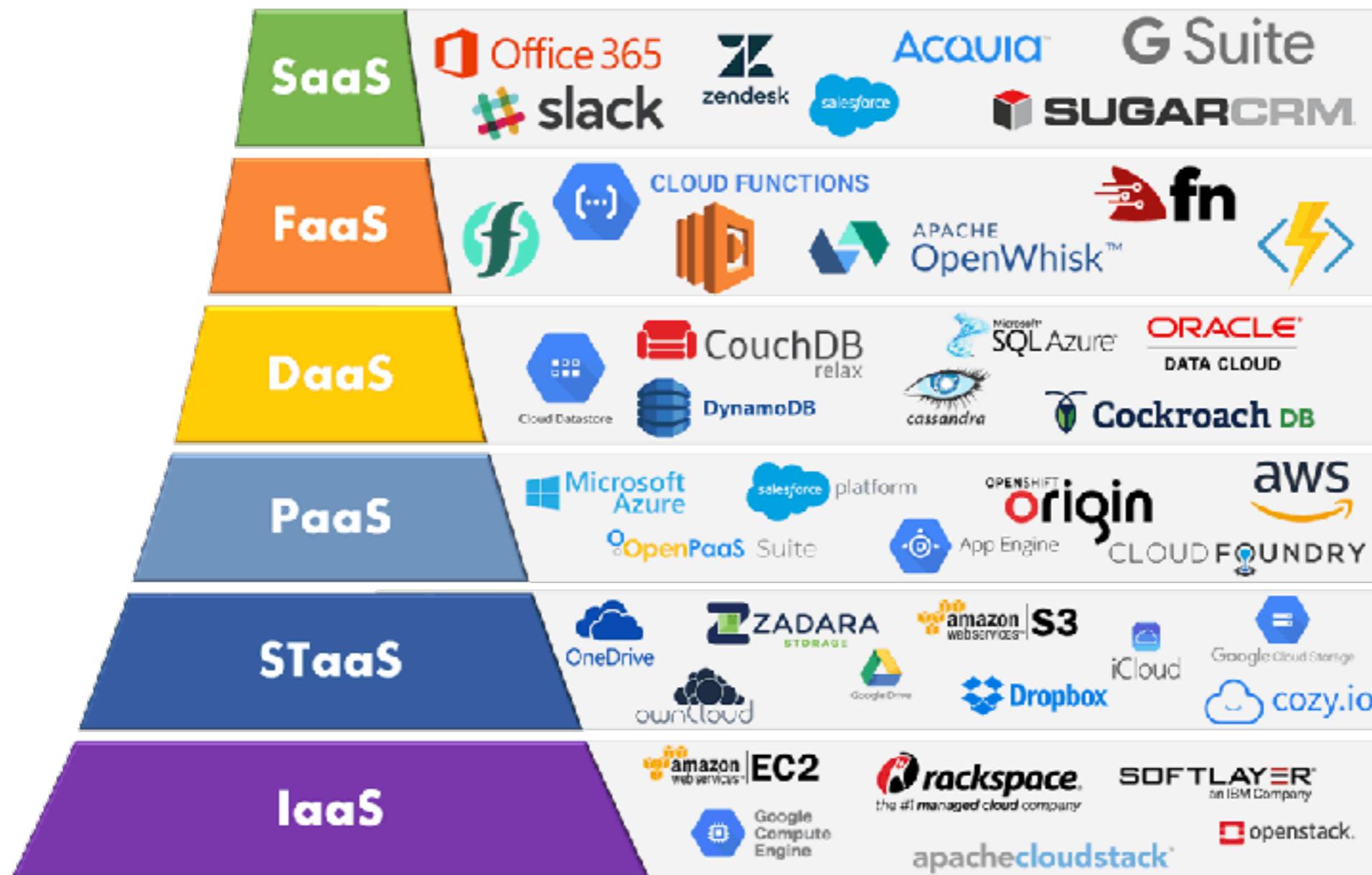
Pizza as a Service



<https://m.oursky.com/saas-paas-and-iaas-explained-in-one-graphic-d56c3e6f4606>

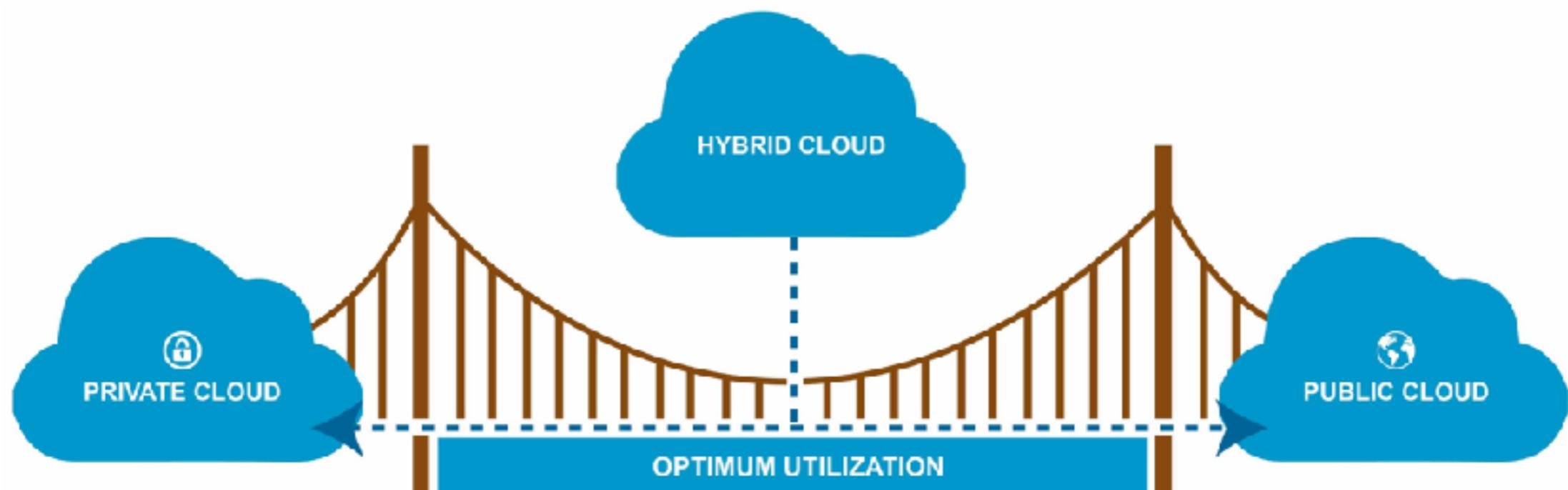


Service models of Cloud



Deployment models of Cloud

Public cloud
Private cloud
Hybrid cloud
Community cloud



Comparison

Factors	Public	Private	Hybrid
Security	Low but depend on provider	Most secure	Moderately
Scalability	Highly	Unlimited	Highly
Shared resources	Shared servers	Private servers	Mixed
Cost	Effective	Expensive	Moderately
Owner	Service provider	Enterprise	Enterprise
Target users	Small, medium organization, individual	Enterprise	Enterprise
Example	AWS, GCP	VMware Cloud, OpenStack	AWS outpost, Google anthos, Azure hybrid



Use cases



Use cases

Industry

Use cases

Insurance

Customer renew auto policies at the same time annually

E-commerce

11-10
Black Friday
Limited-time products

Streaming service

When the stream service released all 15 episodes

Cost

Effective

Owner

Service provider

Target users

Small, medium organization, individual

Example

AWS, GCP



Scaling

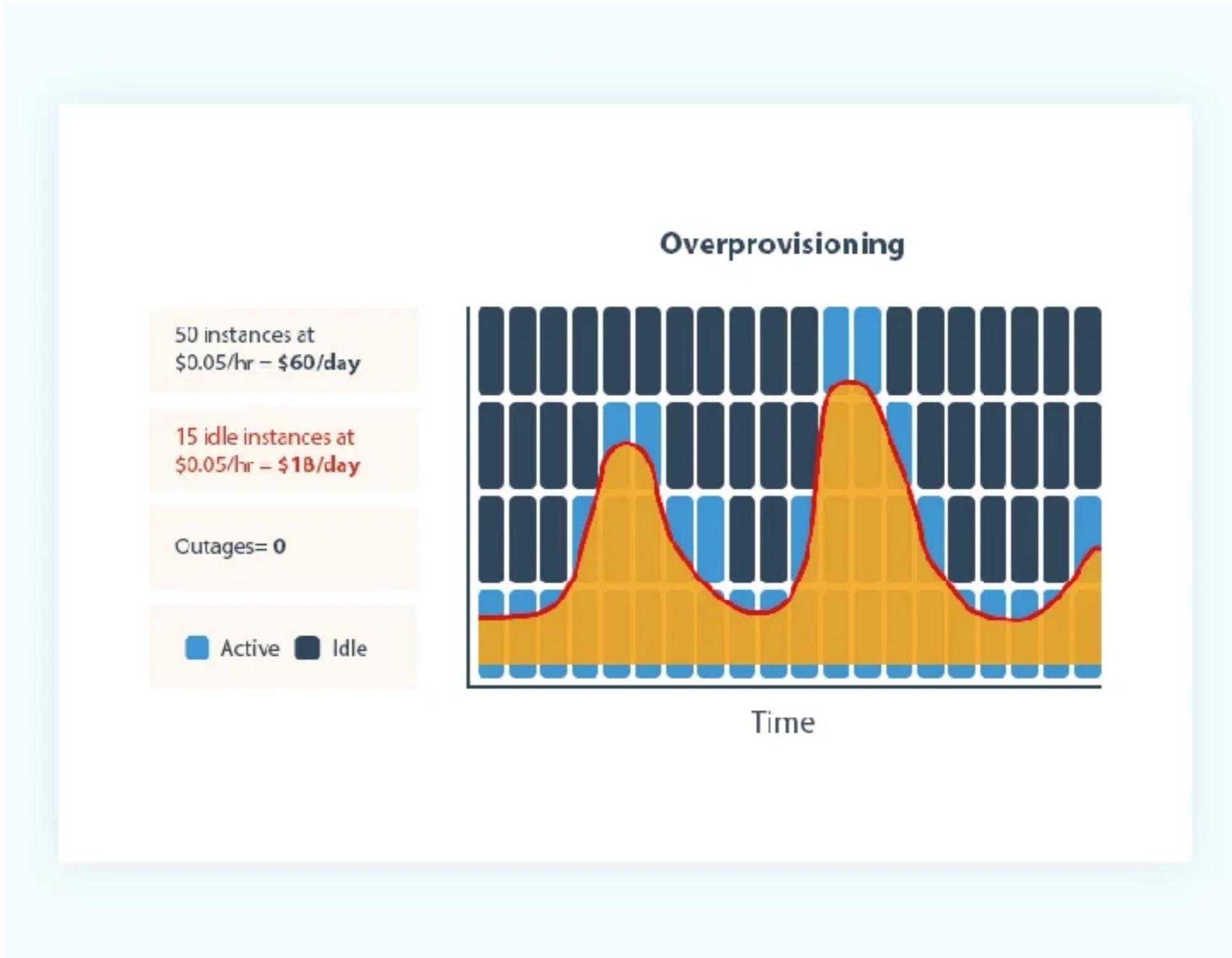


Vertical Scaling
(Scaling up)

Horizontal Scaling
(Scaling out)



Over-provisioning



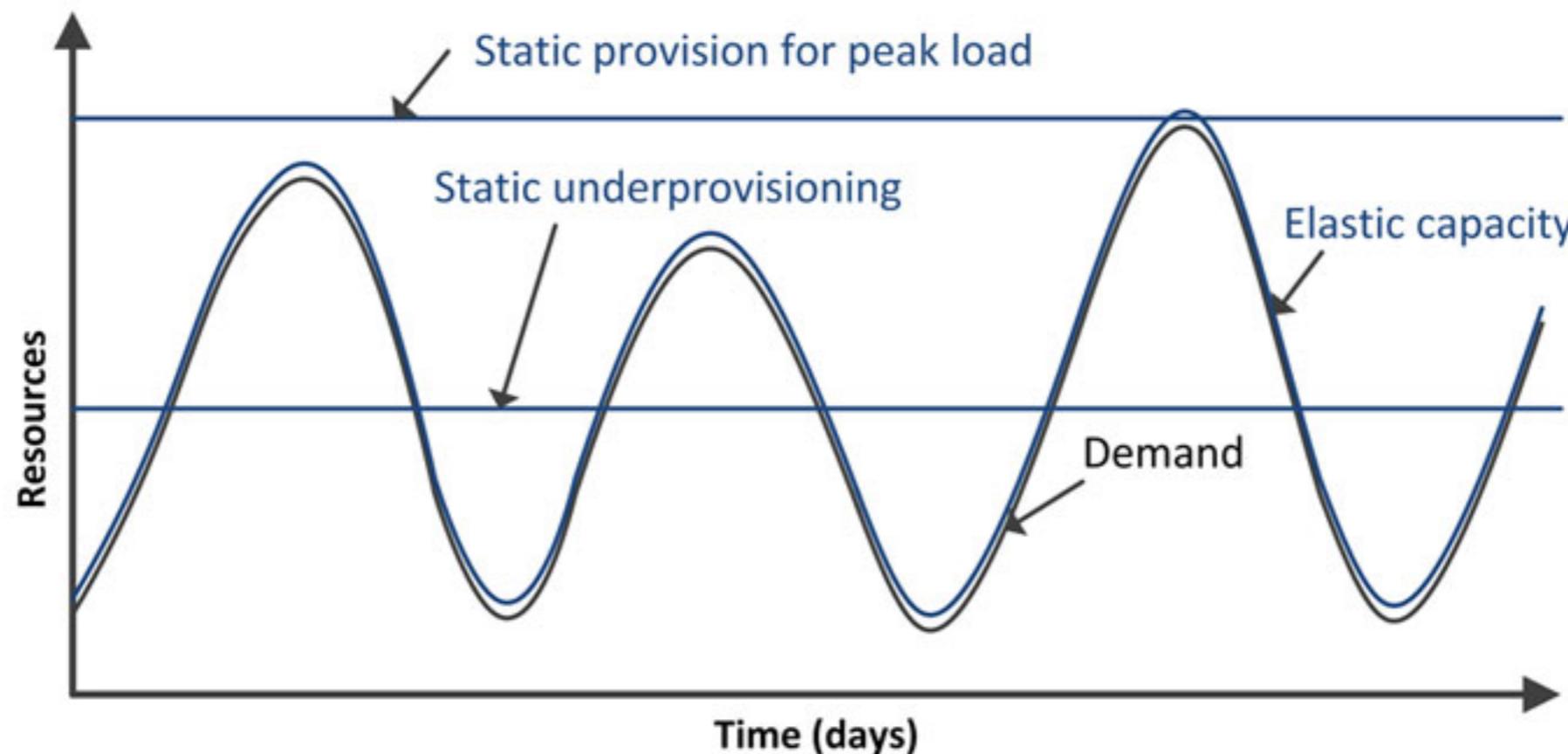
Under-provisioning



Elastic scaling

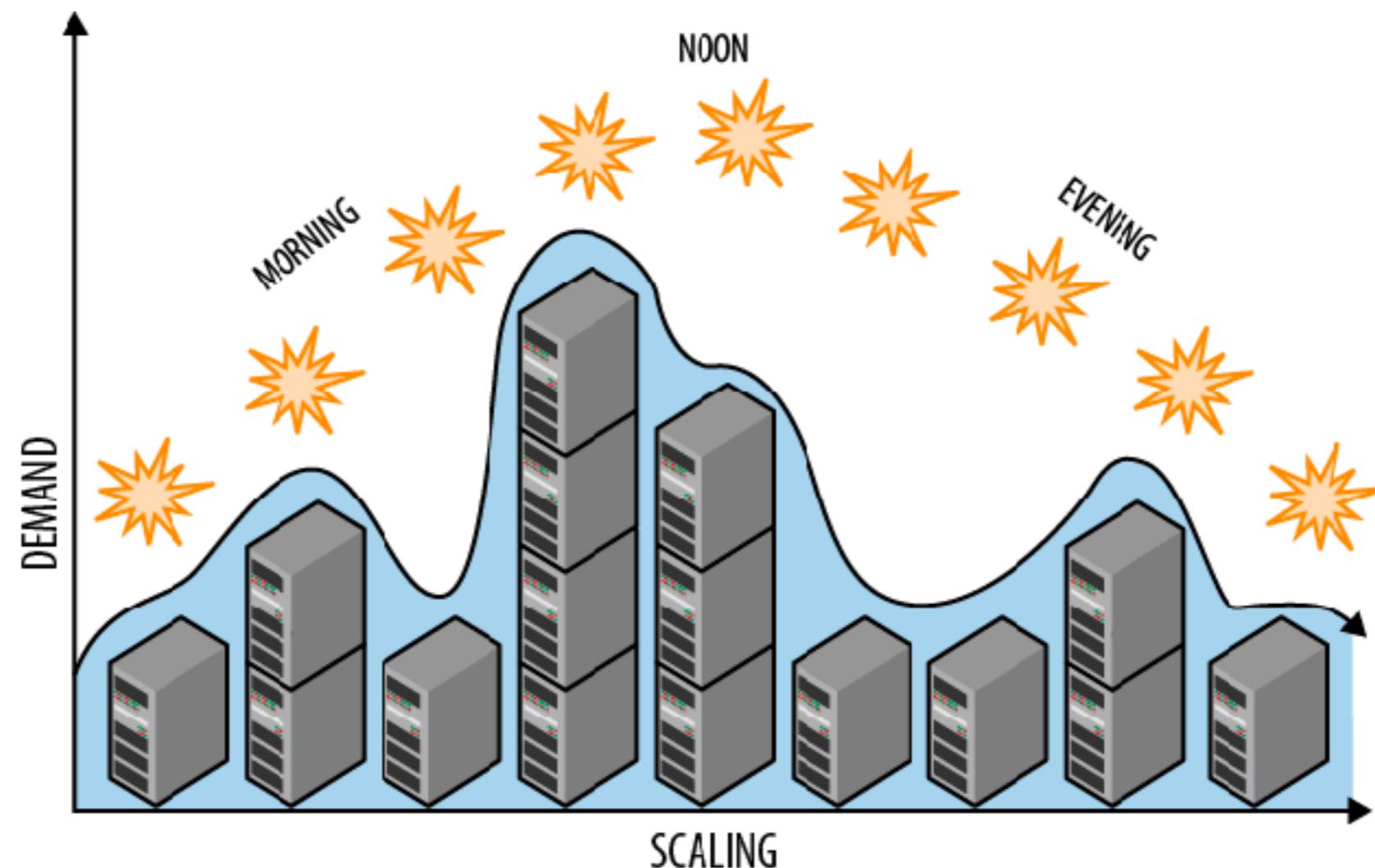


Elasticity Scaling



Elasticity Scaling

Reduce cost and improve performance by scaling automatically !!



Elasticity Scaling on Cloud

Balance performance and cost-effectiveness

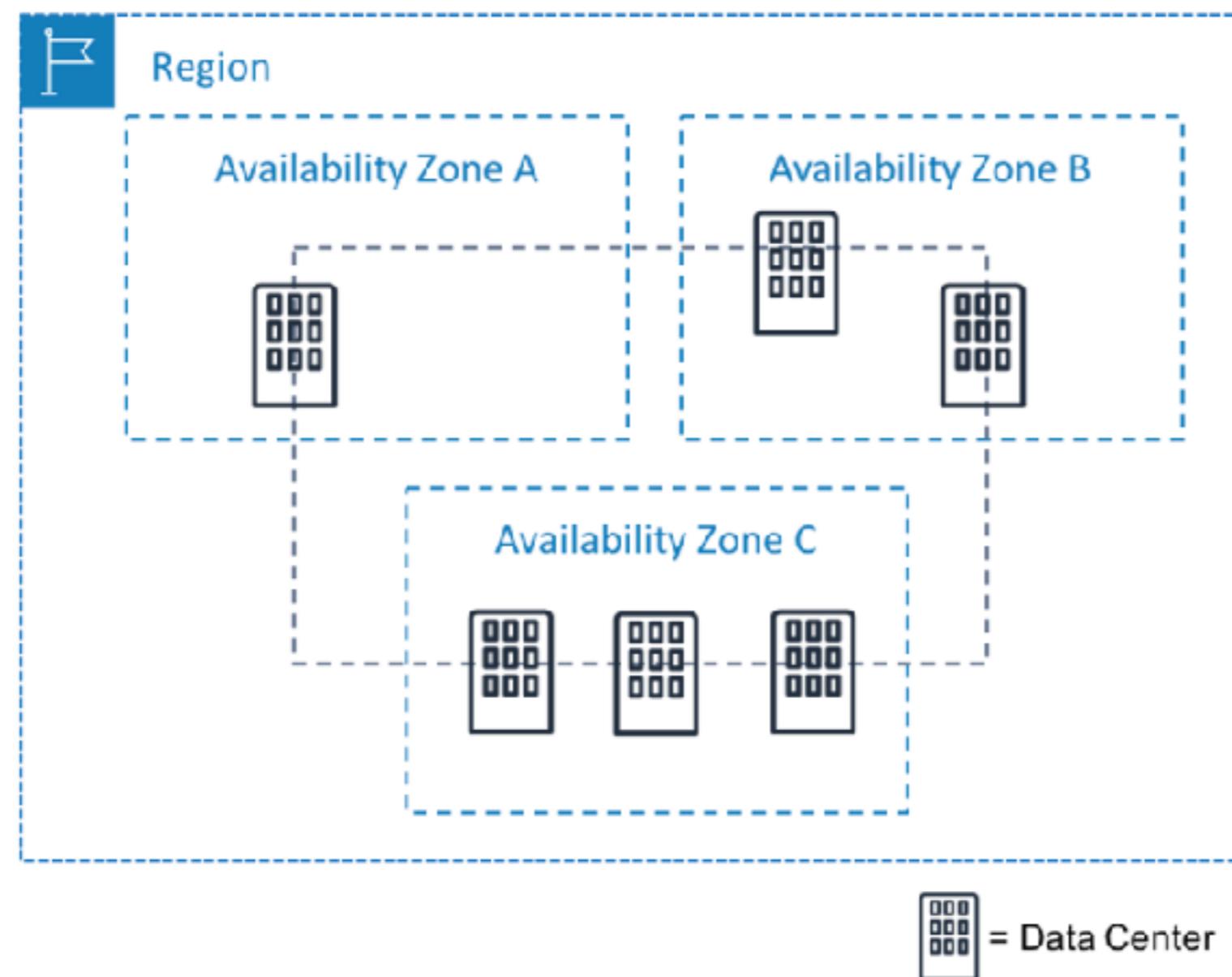
Provide system monitoring tools to track resources utilization

Automatic analyze utilization vs. resource allocation



High Availability

Build-in disaster recovery, auto backup into services



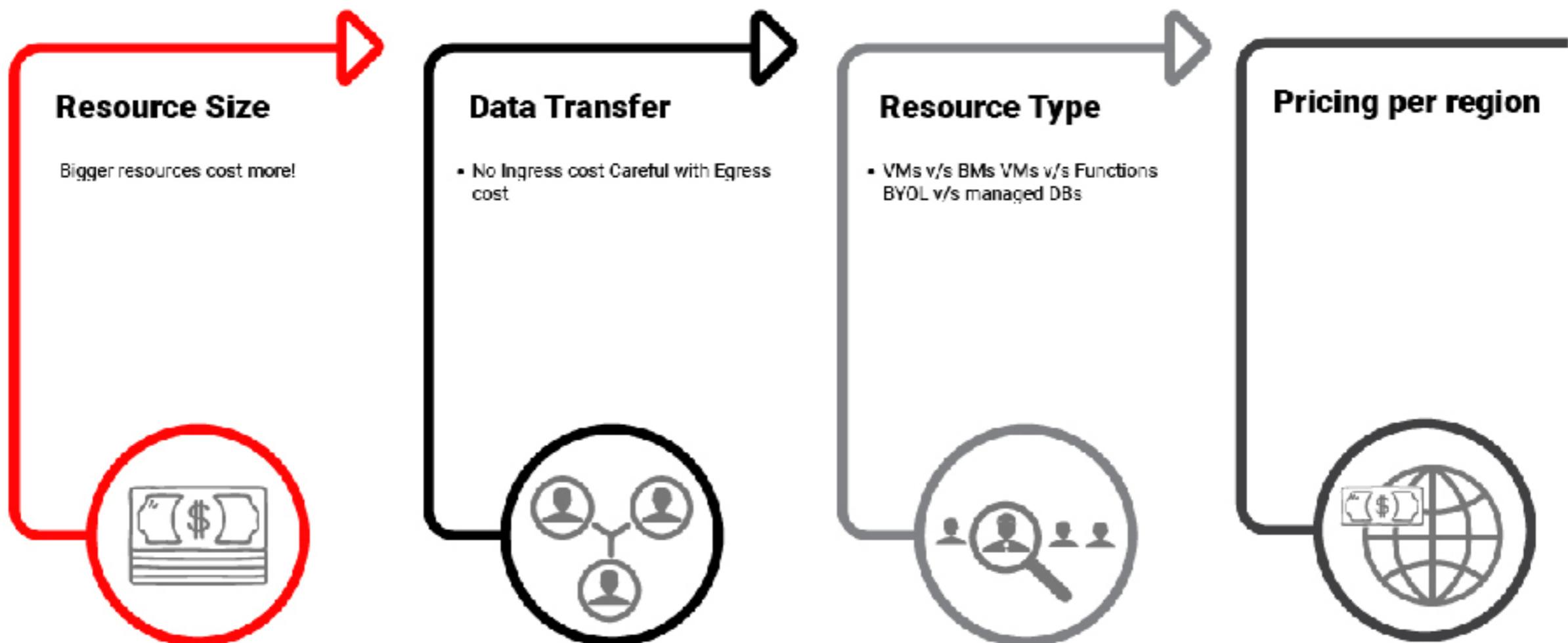
Cons

Provider dependency
Internet dependency
Regulatory compliance
Limited control (less custom, vendor lock-in)
Data privacy concern
Latency concern

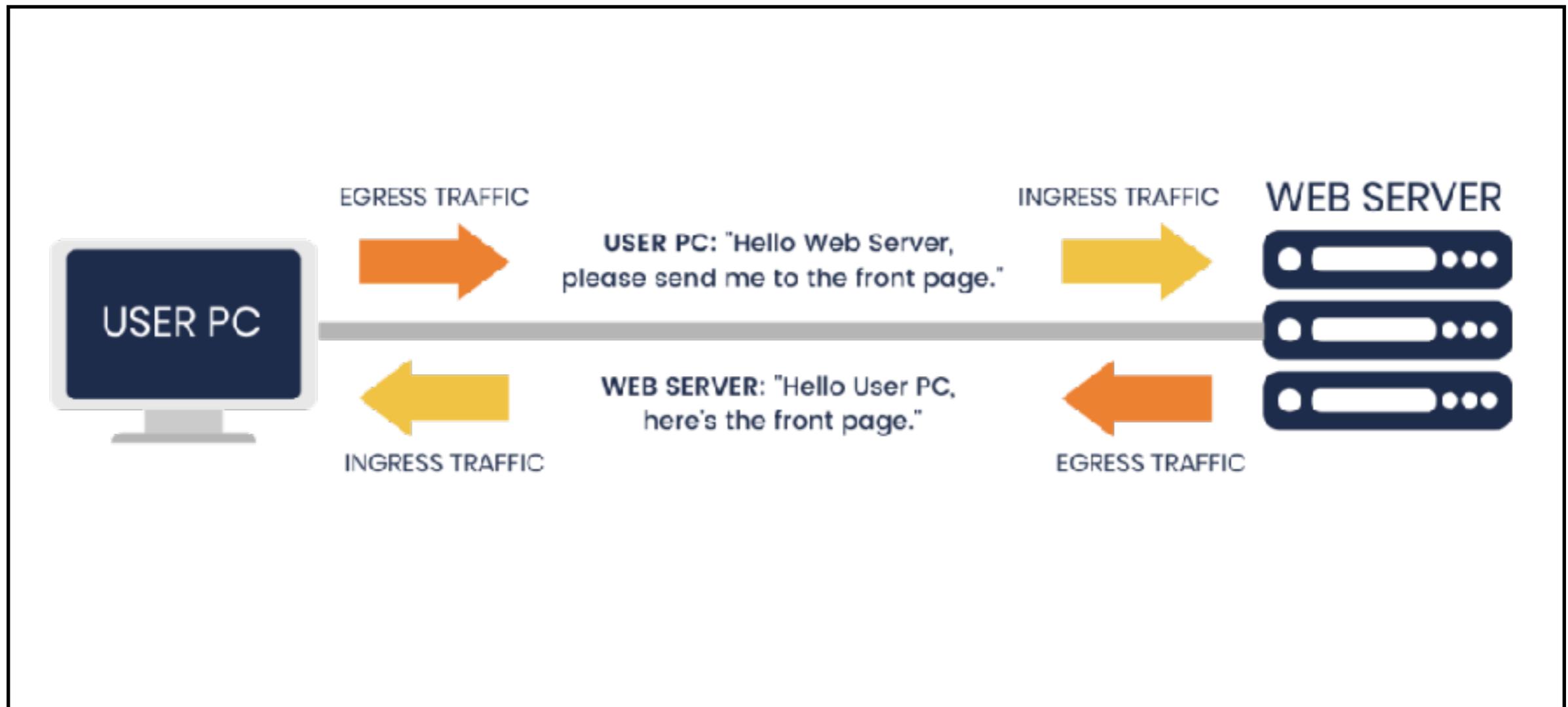
Subscription-based pricing, it good for initial but in long term usage may become expensive for heavy workload



Pricing on Cloud Infrastructure



Ingress vs Egress



Ingress vs Egress

Egress Costs by Public Cloud

Public Cloud	Egress Pricing (per GB)	Total Cost for 500 TB
	<ul style="list-style-type: none">• 1 Gb-10 TB: \$0.09• 10-50 TB: \$0.085• 50-150 TB: \$0.07• 150-500 TB: \$0.05• 500+ TB: Contact Amazon	\$28,800
	<ul style="list-style-type: none">• 5 GB-10 TB: \$0.087• 10-50 TB: \$0.083• 50-150 TB: \$0.07• 150-500 TB: \$0.05• 500+ TB: Contact Azure	\$28,770
 Google Cloud Platform	<ul style="list-style-type: none">• 0-1 TB: \$0.12• 1-10 TB: \$0.11• 10+ TB: \$0.08	\$40,310

Source: William Blair Equity Research



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PCI DSS on Cloud

PCI DSS

การพัฒนา



มาตรฐานการรักษาความปลอดภัยของข้อมูลบัตรเดบิตและบัตรเครดิต (PCI DSS) คือมาตรฐานการรักษาความปลอดภัยของข้อมูลที่เป็นกรรมสิทธิ์ของทุกๆ สถาบันการเงินทั่วโลก ซึ่งรวมถึง American Express, Discover Financial Services, JCB International, MasterCard Worldwide และ Visa Inc.

PCI DSS ฝึกอบรมให้กับบุคลากร ประเมิน บริษัทและหน่วยงานต่างๆ ที่ดำเนินการด้านการชำระเงิน ที่ต้องมีมาตรฐานเดียวกัน (SAD) ที่ต้องมีเจ้าหน้าที่ ผู้จัดการ ผู้ดูแล ผู้อุปกรณ์ และผู้ใช้บริการ PCI DSS เป็นเครื่องยืนยันว่าได้ดำเนินการตามมาตรฐานเดียวกันและควบคุมความเสี่ยงทางการเงินอย่างมีประสิทธิภาพ

ลูกค้าสามารถเข้าถึงห้องเรียนที่ออกแบบมาเพื่อสอนการปฏิบัติตามเกณฑ์ PCI DSS ได้ผ่าน AWS Artifact ซึ่งเป็นแพลตฟอร์มบริการรับเชื่อมต่อที่ให้บริการติดตามการปฏิบัติตามเกณฑ์ PCI DSS ที่ต้องการ ลูกค้าสามารถเข้าถึงห้องเรียนที่ต้องการได้โดยตรงจาก AWS Management Console หรือ เว็บไซต์ที่มีรายละเอียดเพิ่มเติม [การเข้าถึงห้องเรียน AWS Artifact](#)

AWS PCI DSS ได้รับการรับรองหรือไม่

บริการใดบ้างที่ AWS ที่เป็นไปตามข้อกำหนดของ PCI DSS

ทรัพยากรที่มีอยู่ใน AWS Artifact

- คู่มือการปฏิบัติตามข้อกำหนด PCI DSS 4.0 บน AWS
- คู่มือการดำเนินการของผู้ดูแลและการแบ่งส่วน
- เอกสารประกอบของ AWS PCI 3DS
- แนวทางการเข้าถึงและประเมินของ PCI DSS
- แนวทางการประเมินของ PCI DSS

<https://aws.amazon.com/th/compliance/pci-dss-level-1-faqs/>



PDPA on Cloud

ความเป็นส่วนตัวของข้อมูลในประเทศไทย

נכשרה

AWS ផ្តល់ការអនុវត្តគេហទំនាក់ទ័រប្រចាំឆ្នាំ ដើម្បីស្វែងរករាយការងារបច្ចេកទេស

แหล่งข้อมูลเกี่ยวกับความเป็นส่วนตัวของข้อมูลในประเทศไทย

การใช้ AWS ในระบบเก็บข้อมูลเชิงพิจารณาด้านการบากป้องความเสี่ยงส่วนตัวและป้องกันภัยไซเบอร์

ມາຮນອ່ວປສຫອງ Amazon

สำเนาตามที่พนักงานได้ขอรับ ISO 27018 ของ AWS

Amazon Web Services: การบริการของ Amazon ที่ช่วยให้คุณสามารถสร้างเว็บไซต์และแอปพลิเคชันของคุณได้ง่ายขึ้น

<https://aws.amazon.com/th/compliance/thailand-data-privacy/>



Cloud Computing

Scalability

Cost

Flexibility

Maintenance

**Enabling business to innovate and grow
more efficiency**



Q/A

Concerns and real-life scenarios



Concerns and Myths of Cloud computing

Security

Compliance

Cost
management



Security Concerns



Security Concerns

The cloud is not secure
compared to on-premise



Cloud Security Features

Encryption

Identification and
Access Management
(IAM)

Network security

Continuous
Monitoring, Audit
and updated



Compliance and Data Privacy



Compliance and Data Privacy

We will lose control over our data and
violate compliance regulations



Basic in Cloud provider



Cloud Compliance Features

Regulatory compliance

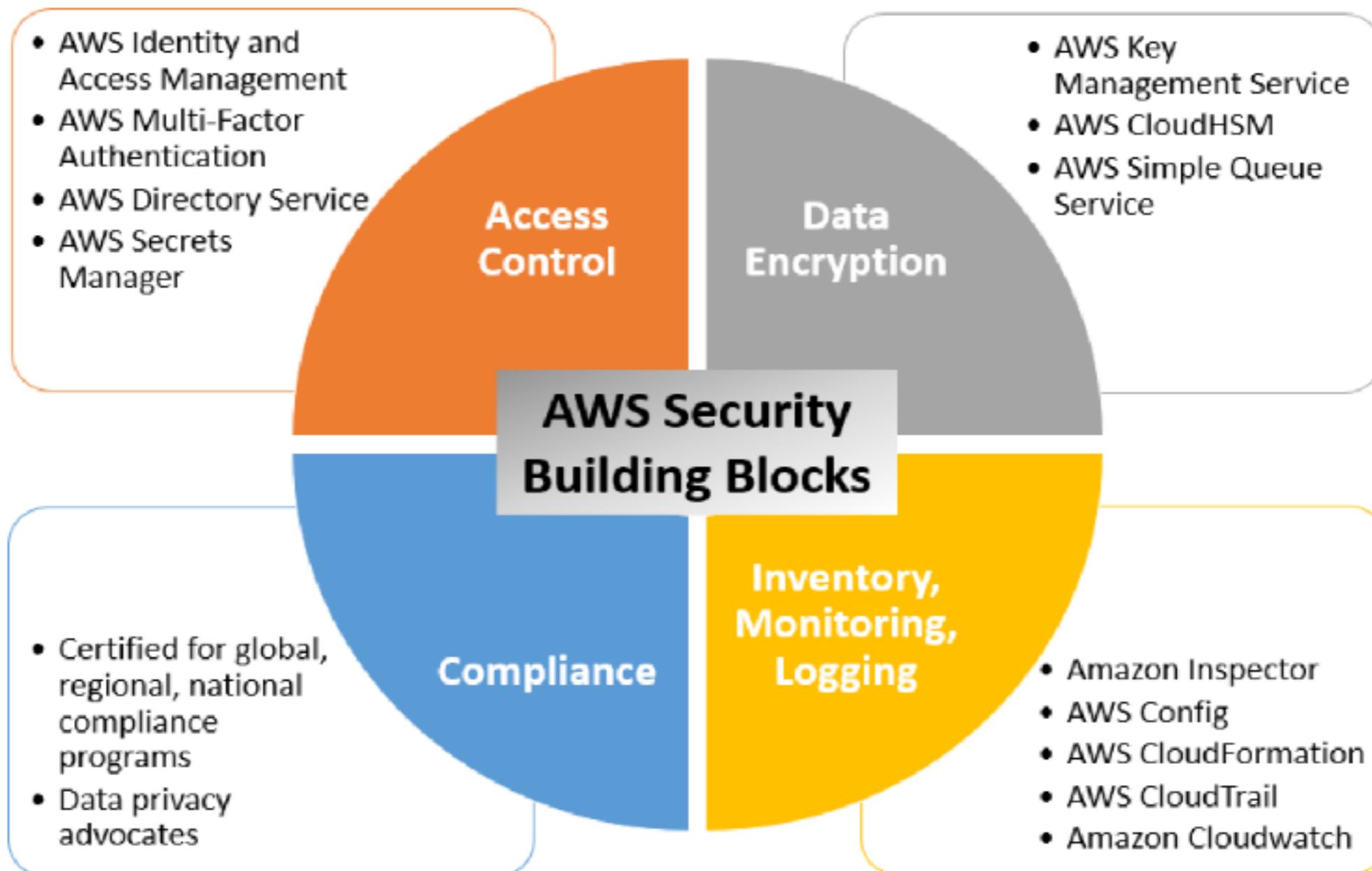
Data residency

Audit trails

Continuous
Monitoring, Audit
and build-in report



Example for AWS



Example for Google Cloud

The Google Cloud Architecture Framework

A set of best practices to help users design, build, and operate workloads on Google Cloud that are secure, resilient, high-performing, and cost-effective.

The Six Pillars of the Architecture Framework

Operational Excellence

Efficiently deploy, monitor, and manage your cloud workloads.



Security, Privacy, Compliance

Maximize security, design for privacy, and align with regulatory requirements.



Reliability

Design and operate resilient and highly-available workloads in the cloud.



Cost Optimization

Maximize the business value of your investment in Google Cloud.



Performance Optimization

Design and tune your cloud resources for optimal performance and efficiency.



System Design

Define the architecture, components, and data you need to satisfy your business and system requirements.



<https://www.googlecloudcommunity.com/gc/Community-Blogs/The-Architecture-Framework-is-Now-Part-of-the-Google-Cloud/ba-p/176786>



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Cost Management



Cost Management

The cloud will be more expensive in the long run



Pay-as-you-go Pay-as-you-use



Cloud Cost Control Mechanisms

Pay-as-you-go

Elastic/Auto scaling

Reserved instance
(Long term
commitment)

Cost management tools
AWS cost explorer
Azure cost mgt



AWS Finance Management

AWS Cloud Financial Management Services

Whether you want to organize and track your cost and usage, enhance control through consolidated billing and access permission, enable better planning through budgeting and forecasting, or further lower cost with resources and pricing optimizations, you can leverage our services, tools, and resources to help reduce your AWS bill.

Use Cases	Capabilities	AWS Resources
Organize	Construct your cost allocation strategy that aligns with your business logic	AWS Billing Conductor AWS Cost Allocation Tags AWS Cost Categories
Report	Raise awareness and accountability of your cloud spend with the detailed, allocable cost data	AWS Cost Explorer AWS Cost and Usage Report AWS Application Cost Profiler
Access	Track billing information across the organization in a consolidated view	AWS Consolidated Billing AWS Purchase Order Management AWS Credits
Control	Establish effective governance mechanisms with the right guardrails in place	AWS Cost Anomaly Detection AWS Identity and Access Management AWS Organizations AWS Control Tower AWS Service Catalog
Forecast	Estimate your resource utilization and spend with forecast dashboards that you create	AWS Cost Explorer (Self-Service) AWS Budgets (Event-Driven)
Budget	Keep your spend in check with custom budget threshold and auto alert notification	AWS Budgets AWS Budget Actions AWS Service Catalog
Purchase	Leverage free trials and programmatic discounts based on your workload pattern and needs	AWS Free Tier AWS Reserved Instances AWS Savings Plans AWS Spot Instances Amazon DynamoDB On-demand
Elasticity	Scale and schedule your services based on your expected utilization pattern and needs	AWS Instance Scheduler Amazon Redshift pause and resume EC2 Auto Scaling AWS Trusted Advisor
Rightsize	Align your service allocation size to your actual workload demand	AWS Cost Explorer Right Sizing Recommendations AWS Compute Optimizer Amazon Redshift resize Amazon S3 Intelligent Tiering
Inspect	Stay up-to-date with your resource deployment and cost optimization opportunities	AWS Cost Explorer

<https://aws.amazon.com/aws-cost-management/>



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AWS Cost Explorer

AWS Cost Explorer

Visualize, understand, and manage your AWS costs and usage over time

Get started with AWS Cost Explorer

Product Description

AWS Cost Explorer has an easy-to-use interface that lets you visualize, understand, and manage your AWS costs and usage over time. Get started quickly by creating custom reports that analyze cost and usage data. Analyze your data at a high level (for example, total costs and usage across all accounts), or dive deeper into your cost and usage data to identify trends, pinpoint cost drivers, and detect anomalies.

Benefits

Preconfigured views +

Filtering and grouping +

Cost and usage forecast +

Create custom reports +

<https://aws.amazon.com/aws-cost-management/aws-cost-explorer/>



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Azure Cost Management

Microsoft Cost Management

Manage your cloud cost with confidence.



Leverage the latest in Copilot in Azure to bring you insights, accountability controls, and the ability to remediate when opportunities arise.

Get started with Azure

<https://azure.microsoft.com/en-us/products/cost-management>



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Sample case

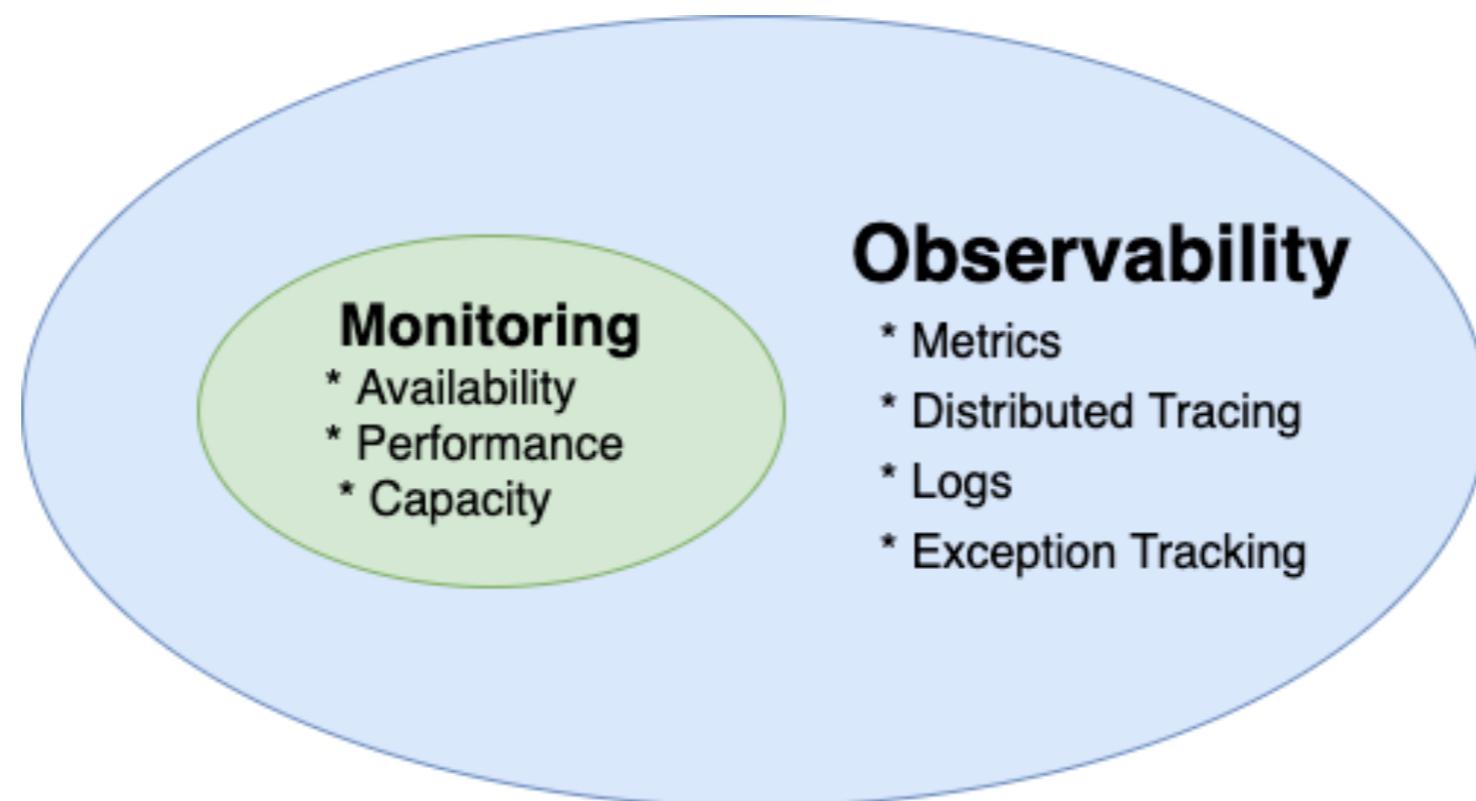
Cost estimation



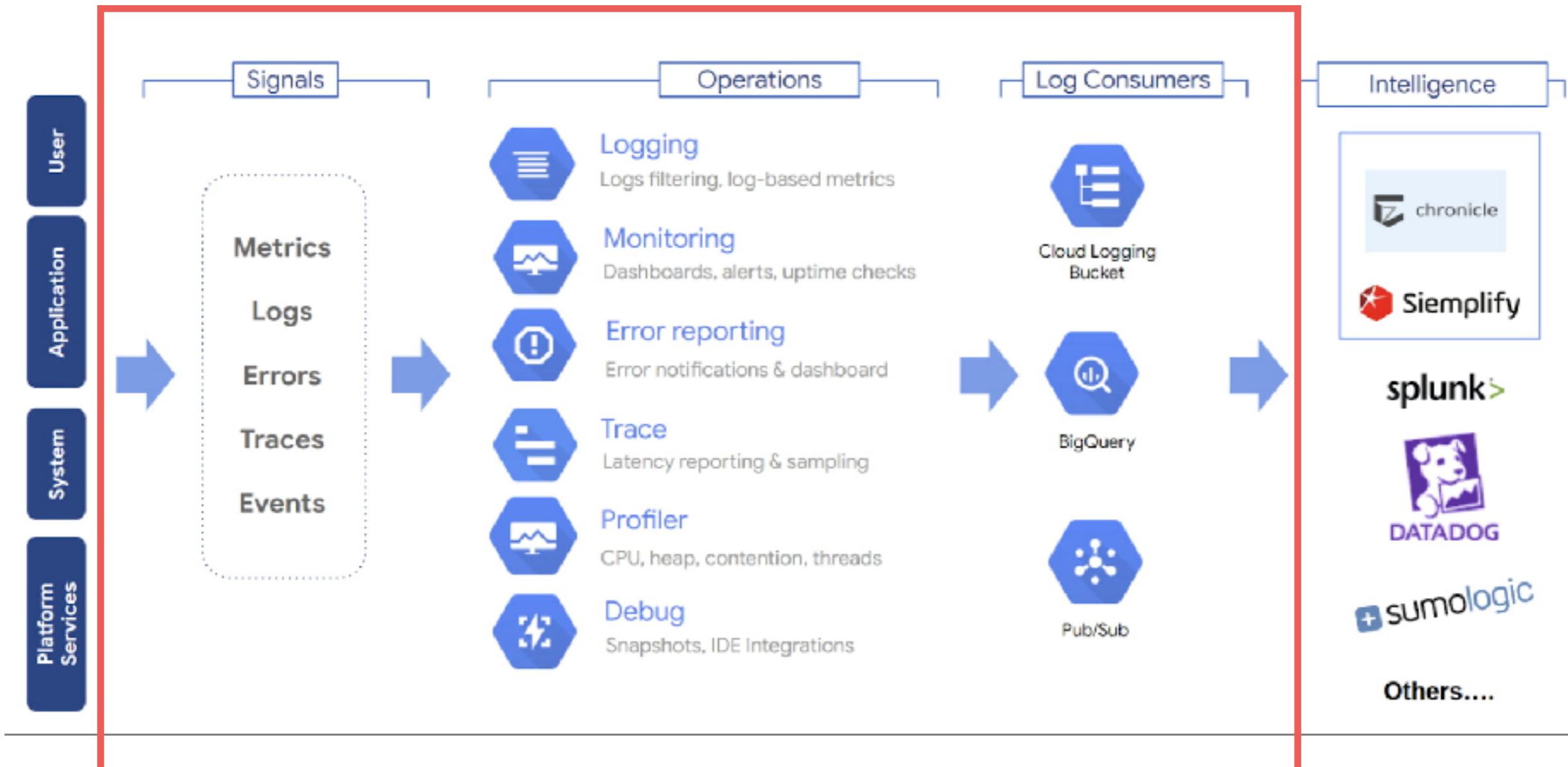
Monitoring and Observability



Monitoring and Observability



Monitoring and Observability



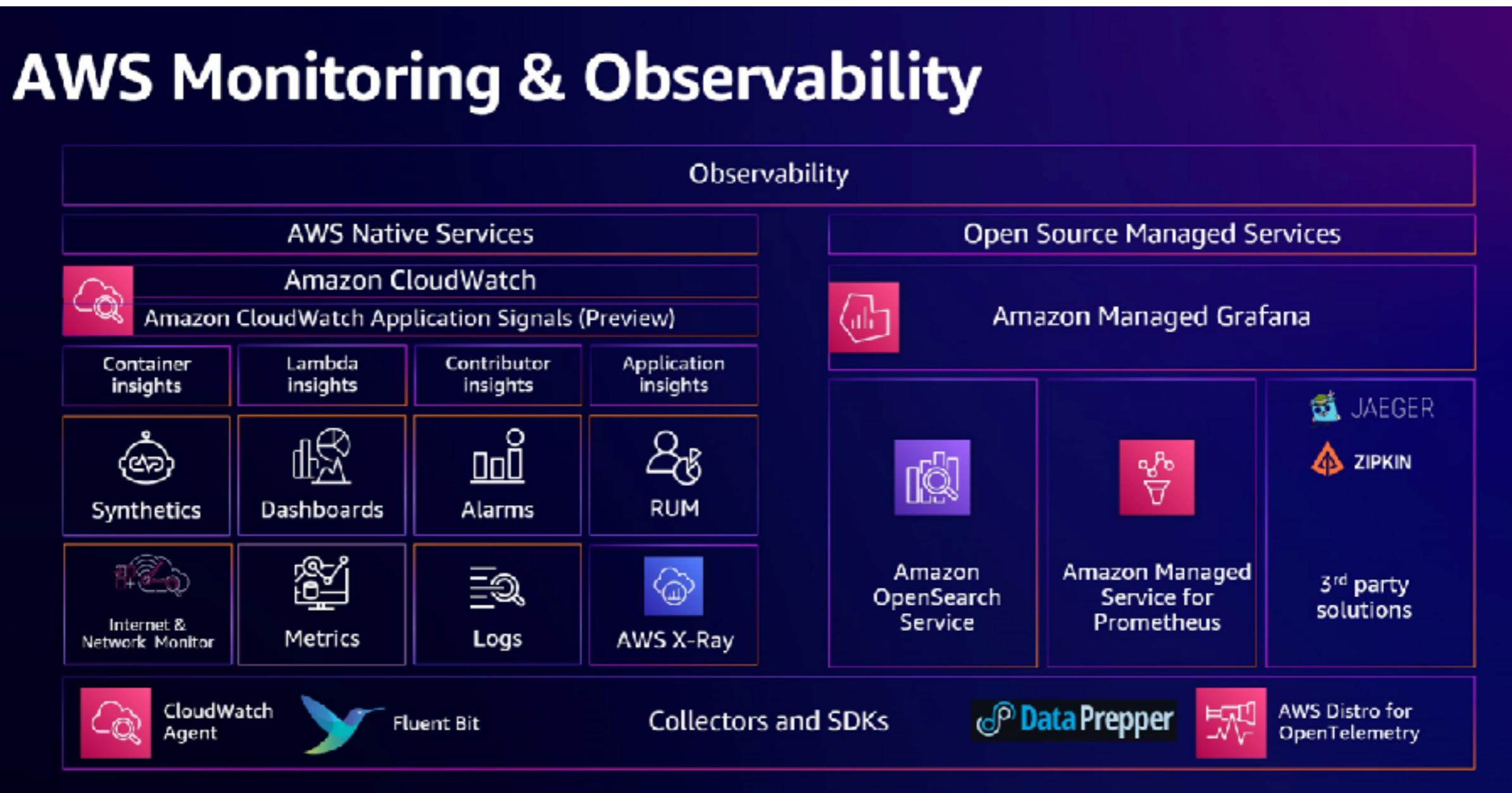
<https://cloud.google.com/blog/products/management-tools/observability-on-google-cloud>



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Monitoring and Observability



<https://docs.aws.amazon.com/decision-guides/latest/monitoring-on-aws-how-to-choose/monitoring-on-aws-how-to-choose.html>



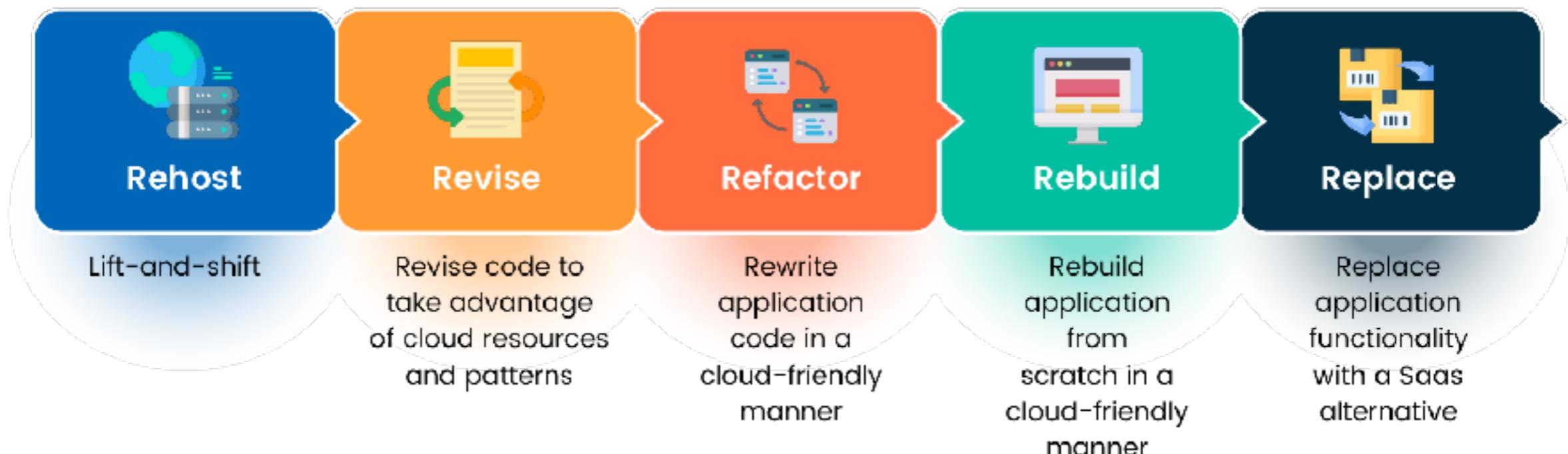
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Migration system to Cloud is more challenge



Migration Strategies



Q/A

