

# FULL STACK



## Introduction to Cloud Computing

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## Public Cloud Services and Pricing





# Learning Objectives

By the end of this lesson, you will be able to:

- 🕒 Explain how cloud providers offer low prices to end users
- 🕒 Compare and contrast Capital Expenditure (CapEx) and Operational Expenditure (OpEx)
- 🕒 List the benefits of OpEx
- 🕒 List different cloud provider services



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## How Do Cloud Providers Offer Competitive Rates?

# Factors that Help Cloud Providers Offer Low Prices



Economies of Scale



Total Cost of  
Ownership (TCO)

# Economies of Scale

## Description:

The cost advantage that enterprises get when they operate at a large scale

## Economies of scale:

- Enables large cloud providers to make deals with the government to:
  - Increase tax savings
  - Lower infrastructure costs
  - Improve network connectivity for inter-site communication
- Allows cloud providers to benefit end users by offering lower prices





# Total Cost of Ownership (TCO)

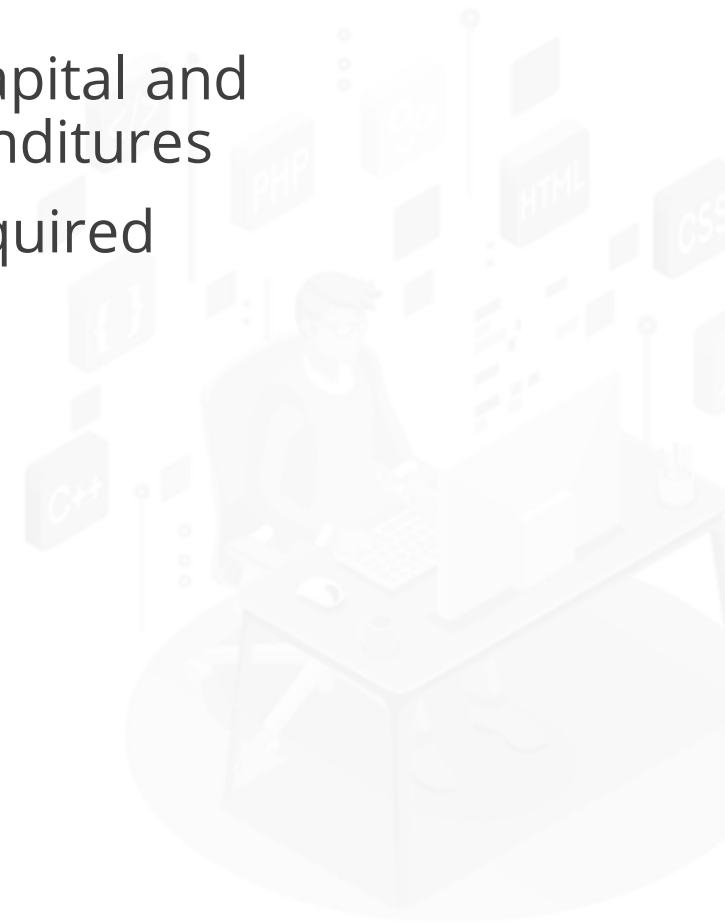


Cloud helps you reduce the TCO by providing a pay-as-you-go model. This model:

- Reduces the need to spend large capital and provides greater control over expenditures
- Procures and uses resources as required

Calculation of TCO involves:

- Capital Expenditure (CapEx)
- Operational Expenditure (OpEx)



# Impact of Cloud Migration on TCO

The following organizations achieved a lower TCO by migrating to the cloud:

News Corp

Honeywell

Verizon

GoPro

WeWork

Intuit

Royal Dutch Shell

DBS Bank



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## Capital Expenditure (CapEx)

# What Is Capital Expenditure (CapEx)?

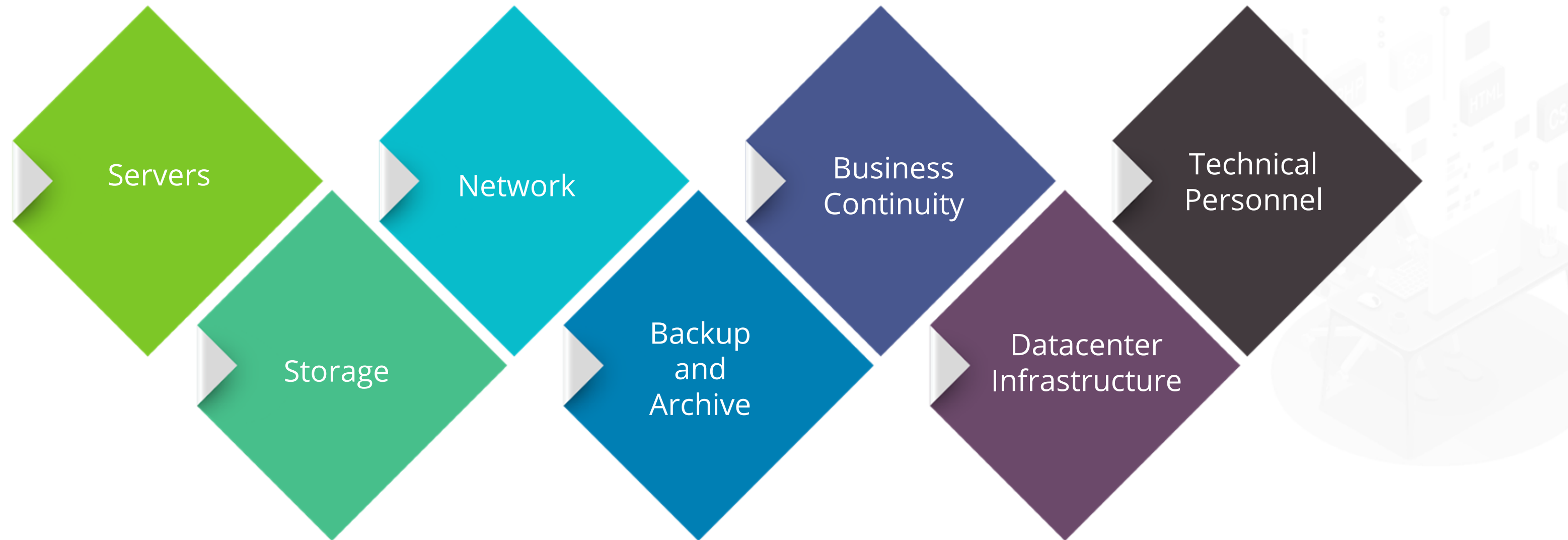
CapEx:

- Upfront expenditure of physical infrastructure
- Is deductible from the accrued tax bill



# CapEx Costs

An on-premise datacenter would incur the costs for:



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## Operational Expenditure (OpEx)



# What Is Operational Expenditure (OpEx)?

OpEx:

- Daily operational costs incurred on services or products
- Is deductible from the annual tax bill
- Involves no upfront cost
- Works on a pay-as-you-go pricing model



# Benefits of OpEx



## Scenarios:

- **You need to support an enterprise application with on-demand scaling:** You incur costs only during upscale.
- **Your on-premise datacenter is low on storage space:** You can add storage from a cloud provider and save CapEx.

# OpEx Costs

The operational costs for cloud computing include:

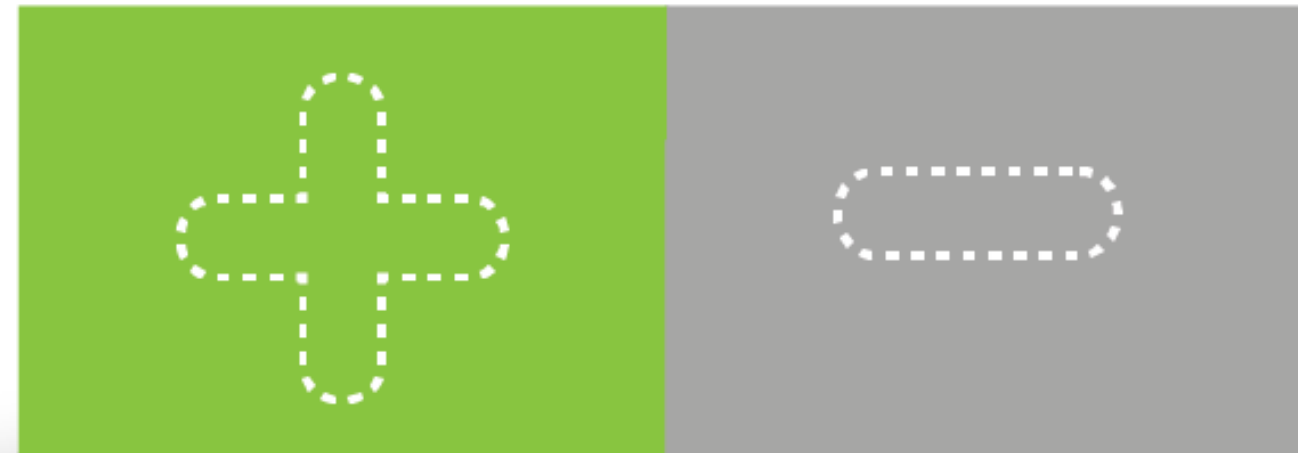


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## Benefits of OpEx over CapEx



# Benefits of OpEx over CapEx



## OpEx

Test new products or services without investment in hardware

Scale infrastructure on-demand

Optimize cost management

## CapEx

Unpredictable growth and demand can outpace expectations

Difficult to scale on-demand

Incur high infrastructure costs

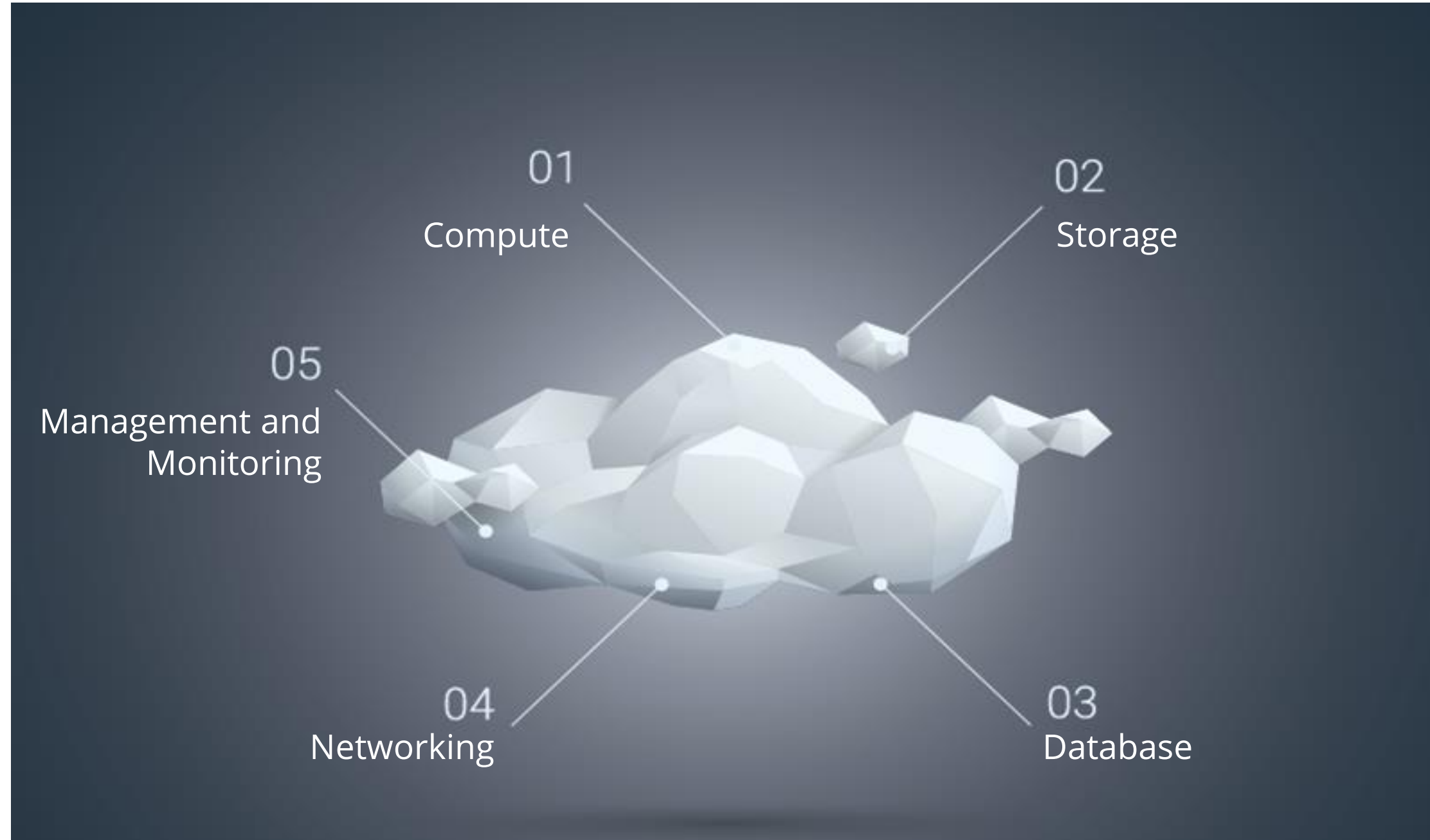


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## Cloud Services

# Cloud Services

Businesses can reduce their infrastructure costs by using these services:



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## Cloud Providers



# Popular Cloud Providers

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**Amazon Web  
Services (AWS)**

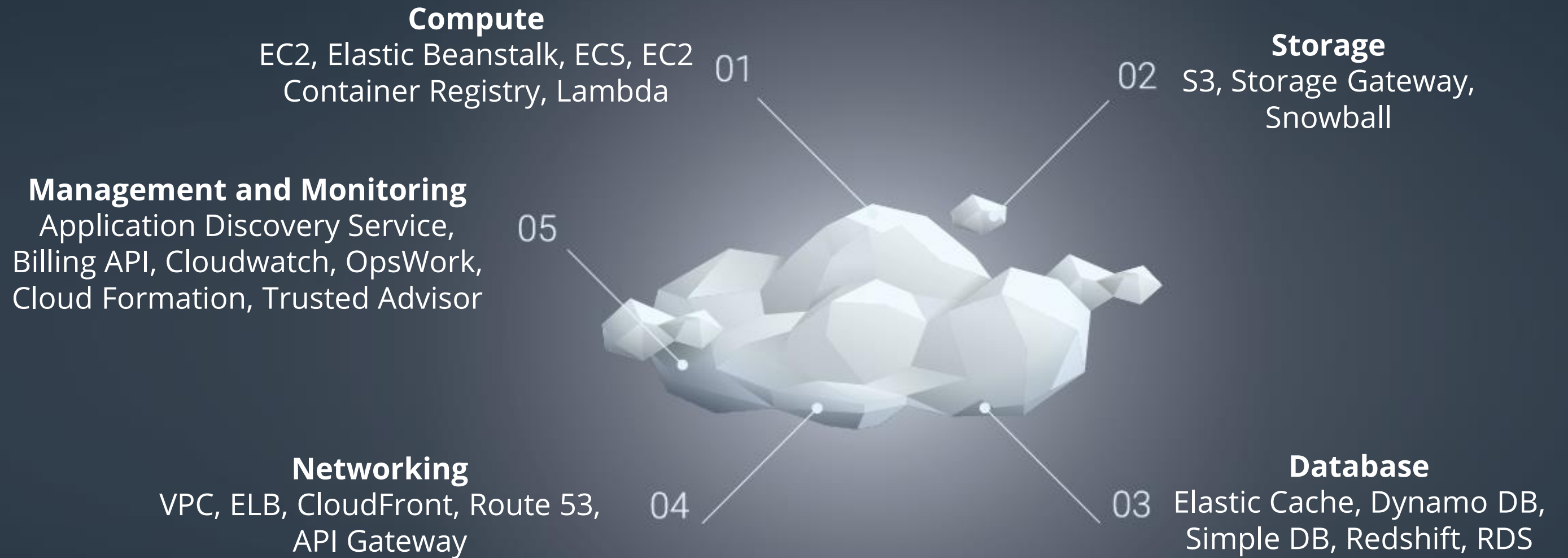
**Microsoft Azure**

**Google Cloud  
Platform (GCP)**

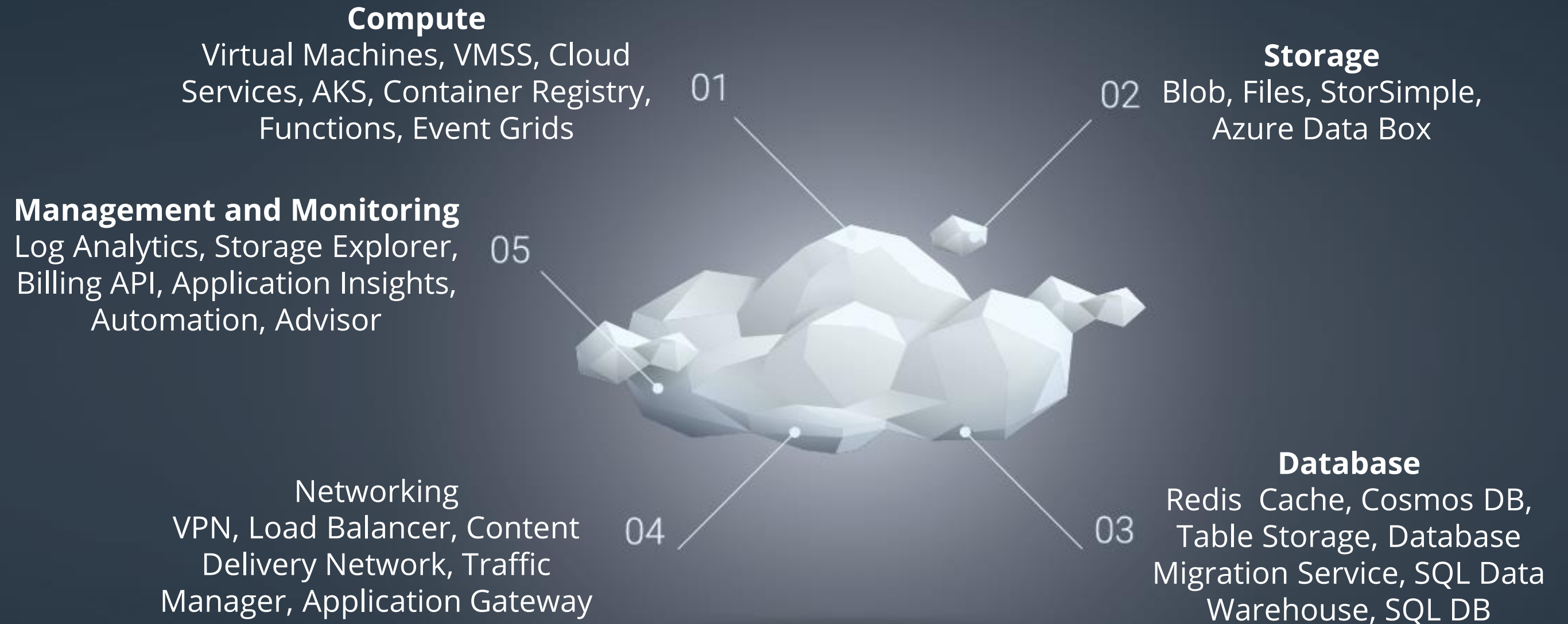
**Alibaba Cloud**



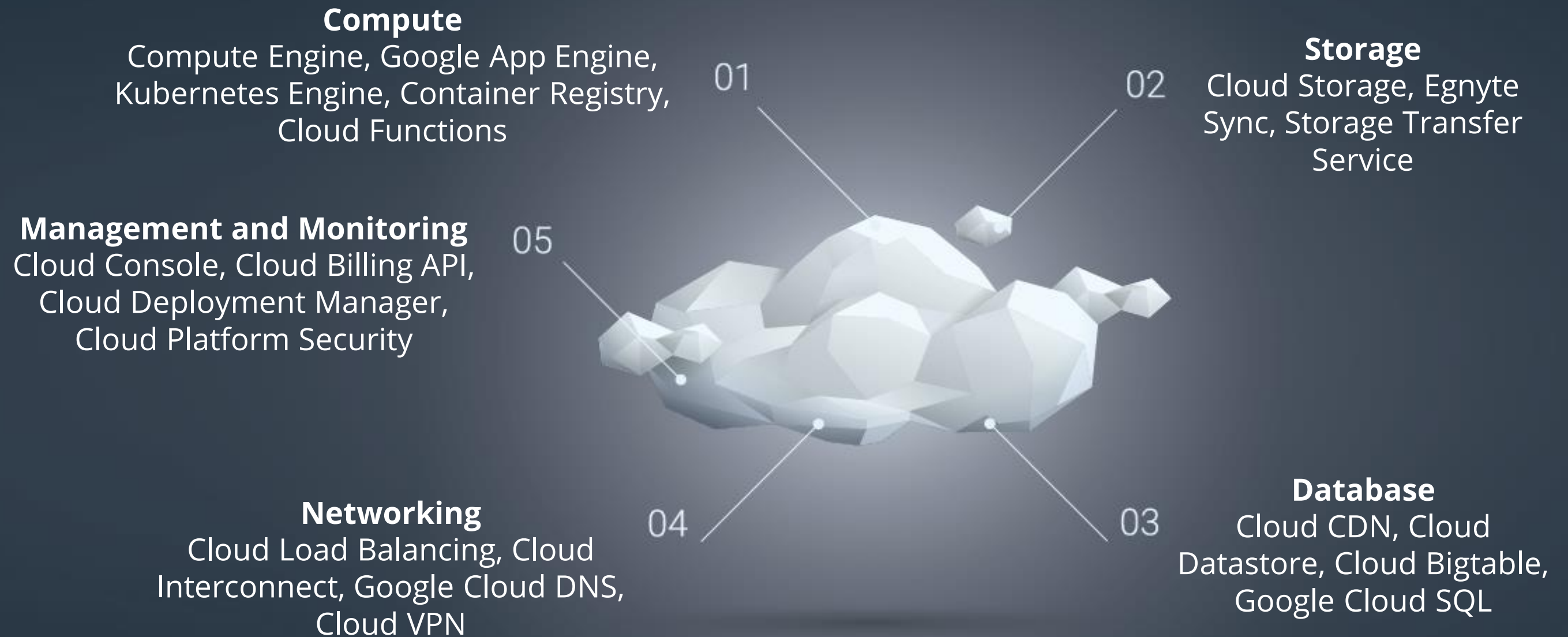
# AWS: Overview of Services



# Microsoft Azure: Overview of Services

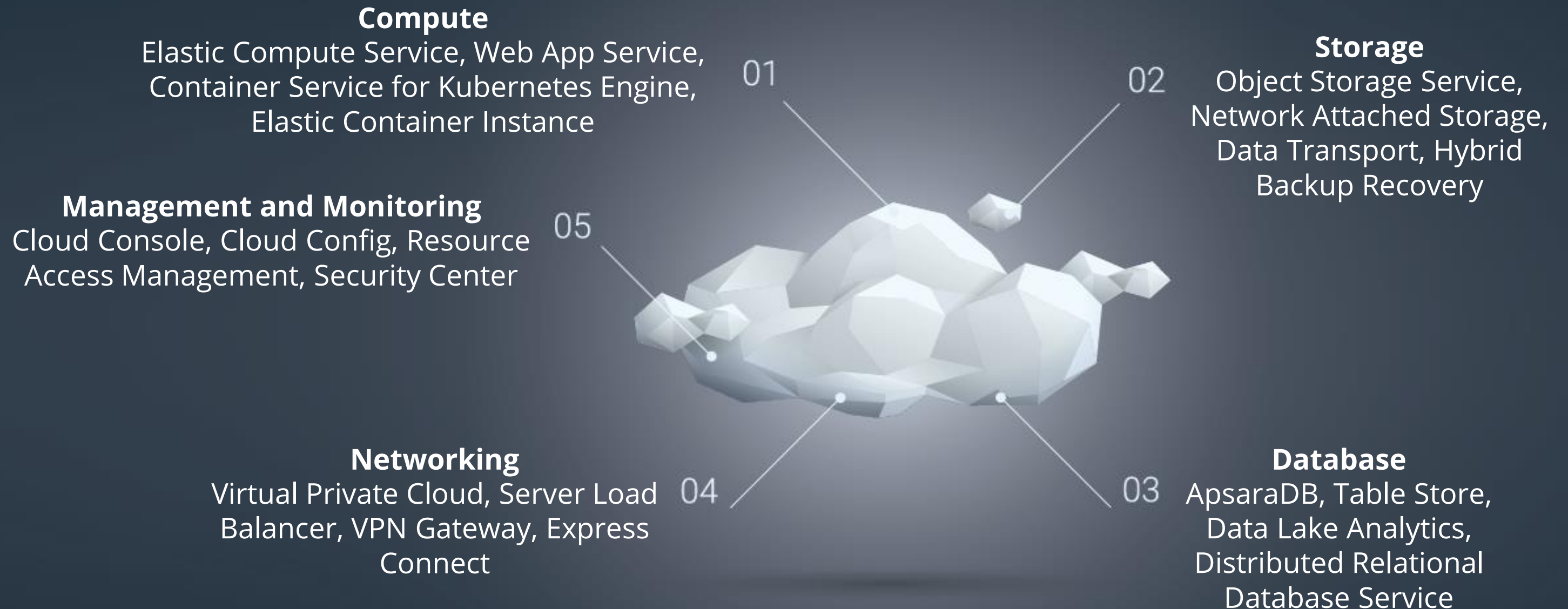


# GCP: Overview of Services





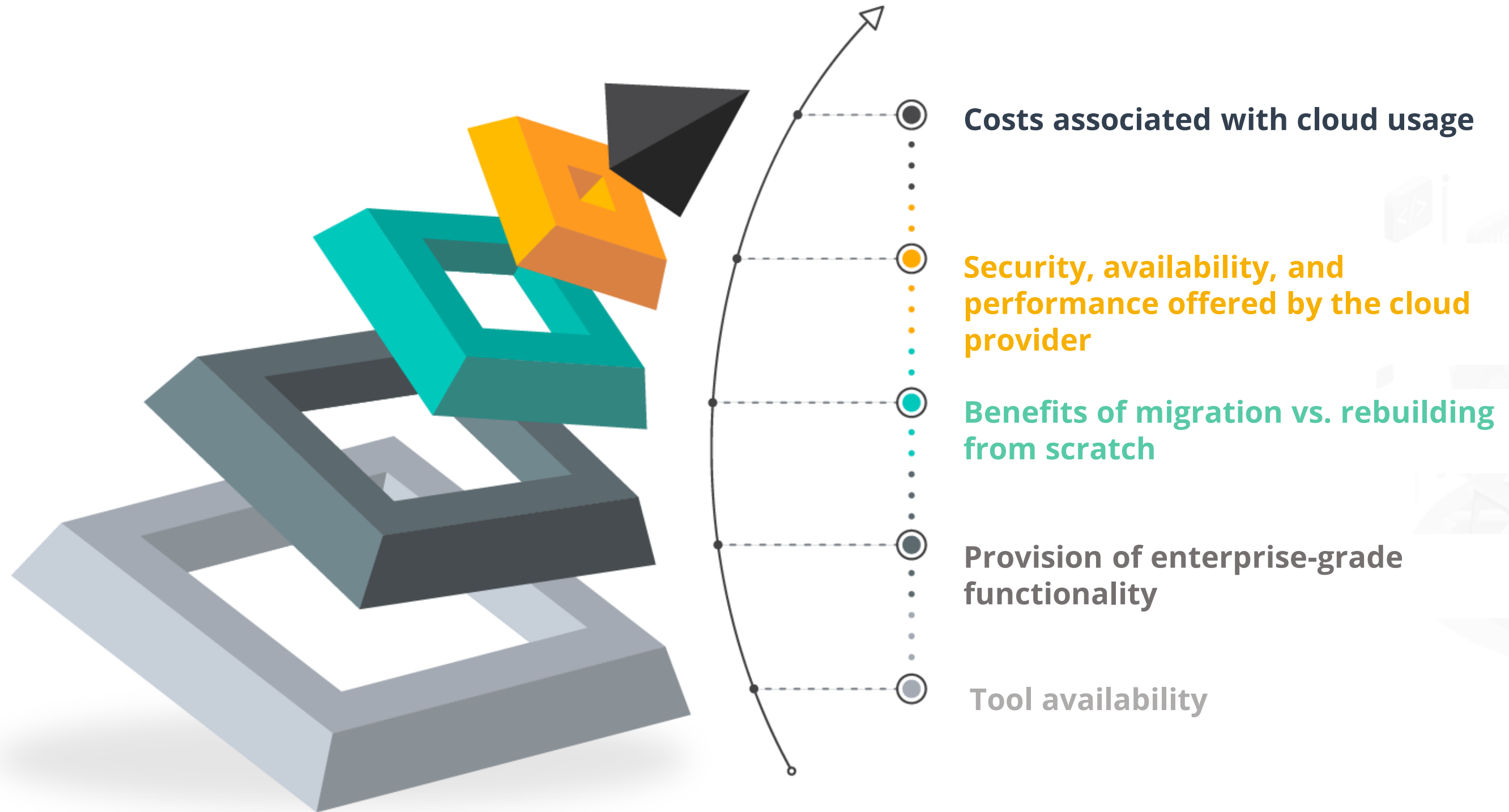
# Alibaba Cloud: Overview of Services



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## Cloud Migration: Factors to Consider

# Factors to Consider Before Migrating to the Cloud



## Key Takeaways

- Cloud providers leverage economies of scale and lower total cost of ownership to provide services at affordable rates.
- CapEx is the upfront infrastructure cost.
- OpEx is the daily operational costs of providing services or products.
- Cloud providers offer compute, storage, database, networking, management, and monitoring services.

