Azure Fundamentals

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Contents

[Describe Core Azure Concepts 3](#_Toc107864194)

[Introduction to Azure Fundamentals 4](#_Toc107864195)

[Introduction 4](#_Toc107864196)

[What is Cloud Computing 4](#_Toc107864197)

[Why is Cloud Computing typically cheaper to use? 4](#_Toc107864198)

[What is Azure? 4](#_Toc107864199)



# Describe Core Azure Concepts

**Learning Outcomes**

* Understand the benefits of cloud computing in Azure and how I can save you time and money
* Explain cloud concepts such as high availability, scalability, elasticity, agility, and disaster recovery
* Describe core Azure components such as subscriptions, management groups, resources, and resource groups
* Summarize geographic distribution concept’s such as Azure regions, region pairs, and availability zones

**Learning Paths**

1. Describe core Azure concepts
2. Describe core Azure services
3. Describe core solutions and management tools on Azure
4. Describe general security and network security features
5. Describe identity, governance, privacy, and compliance features
6. Describe Microsoft cost management and service level agreements

## Introduction to Azure Fundamentals

### Introduction

Azure is cloud computing platform with services to meet business goals. Such services they provide are remote storage, database hosting, and centralized account management. They also offer capabilities in AI, and Internet of Things (aka IoT).

### What is Cloud Computing

Cloud computing is the delivery of computing services over the internet, which is known also as the cloud. These services include servers, databases, networking, software, analytics, and intelligence. Cloud computing offers faster innovation, flexible resources, and economies of scale.

The main benefits of cloud computing are its cost efficiency, scalability, and efficiency. Normally to run large scale applications which receive, send, and store large amounts of data, you would also need a large number of computers to receive, send, and store them. But buying/owning such a thing would be not economical for an average user or small businesses. Therefore, cloud computing becomes very useful as users will no longer have to buy such things to run apps but send, receive, and store their data in the cloud.

### Why is Cloud Computing typically cheaper to use?

Cloud computing is the delivery of computing services over the internet by using a pay as you go pricing model. Users typically pay only for the cloud services users use which helps:

* lower operating costs
* run your infrastructure more efficiently
* scale as business/user needs change

In conclusion cloud computing is a way to rent compute power and storage from someone else’s datacentre. You can treat cloud resources like you would resource sin your own data centre. When you’re done using them, you give them back. You’re billed only or what you use,

Instead of maintaining CPU’s and storage in your datacentre, you rent them for the time you need them. The cloud provider takes care of maintaining the underlying infrastructure for you. The cloud enables you to quickly solve your toughest business challenges and bring cutting edge solutions to users.

To power your services and deliver innovative and novel user experiences faster. The cloud provides on-demand access to:

* a nearly limitless pool of raw compute, storage, and networking components
* speech recognition and other cognitive services that help make your application stand out from the crowd
* analytics services that deliver telemetry data from your software and devices

### What is Azure?

IAAS – Infrastructure

PAAS – Platform

SAAS – Computing

Services:

* virtual machines running in the cloud
* website and database hosting
* advanced computing services:
  + Artificial Intelligence
  + Machine Learning
  + IoT (Internet of all things)

Virtualization – separates the operating system from the computer hardware using an abstraction layer called a Hypervisor.

Hypervisor – Emulates all functions of a real computer and its CPU in a virtual machine. (Optimizing the capacity of the obstructed hardware). It can run multiple virtual machines at the same time and each virtual machine can run any compatible operating system.

Azure takes this Virtualization in a massive scale in all Microsoft data centres all around the world. Each data centre contains mini racks filled with servers and each server includes a hypervisor to run multiple virtual machines.

Network Switch provides connectivity to all those servers. One server in each rack runs a software called a fabric controller.

Fabric Controller is connected to another software called Orchestrator.

The orchestrator is responsible for managing everything that happens in Azure (including responding to user requests). Users make requests using the Orchestrators Web API.