Cloud Infrastructure

Project Assignment

April 2025

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Table of contents

1. Overview 3
2. Functional Requirements 3
3. Resources to deploy 4
4. Deliverables 5
5. Project management - Milestones 5

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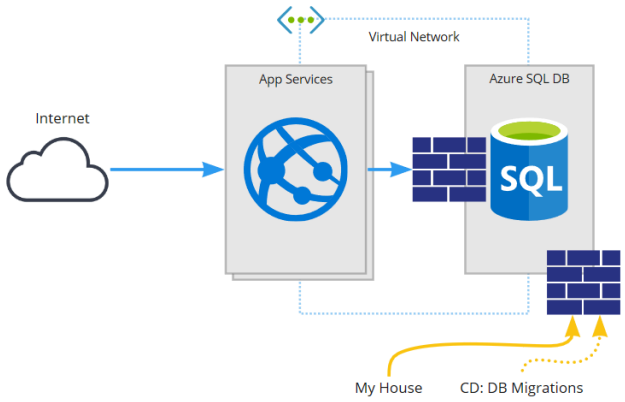

1. Overview

MultiSoftware Enterprise is a multinational software development company headquartered in Athens, Greece, with approximately 350 employees distributed across multiple regions. The company is planning to adopt a cloud-first strategy by building its entire infrastructure directly in the Microsoft Azure cloud—without relying on any legacy systems or on-premises infrastructure.

The main objective of this project is to design and implement a fully cloud-native environment that supports scalable application development, secure data storage, global collaboration, and centralized management—leveraging the benefits of Azure services from the ground up.

The key goals are to establish a secure, resilient, and scalable cloud infrastructure for all departments, empower teams with modern development environments and tools, ensure centralized identity, access control, and data protection, enable agile deployment and maintain cost visibility, compliance, and operational efficiency from day one.

2. Functional Requirements

The cloud infrastructure should achieve the following:

1. Provide authentication and authorization for all company employees, in various internal and external services (e.g., employees portal, Office 365). Users that access any resource outside of the company's offices should be challenged for multi-factor authentication. Administrators should always be challenged for multi-factor authentication. Users should be able to sign-in to their company owned laptops using their Office 365 account credentials. Control access to resources. Developers should be able to use existing resources but not create new ones, while administrators should be able to both utilize existing resources and create new ones as

needed. It is needed to make sure that the whole solution is aligned to sensitive data regulations.

2. Host the company's ASP.NET Core based website (approximately 1000 visitors per day).
3. Structured data must be stored in Azure SQL Database or Cosmos DB depending on the use case. Approximately there will be 2000 read requests and 500 write requests per day. Unstructured data (documents, images, etc.) must be stored in Azure Blob Storage. All data must be backed up automatically and encrypted at rest. Store and backup the company's internal database.
4. Host the company's public API. Approximately 5000 requests per day with an average of 5 kb of data per request.
5. Stateless operations will be provided with serverless implementation.
6. Provide storage for public image and video content used within the company's website. The company API should also be able to return addresses for access to this content. The total size of assets is estimated to be around 250 Gigabytes, with around 100.000 read operations per month and 10.000 write operations.
7. The company will also store detailed server logs for compliance purposes. The total size is estimated to be around 5 terabytes, with 50 new gigabytes being added per at the end of each month. The data is kept for archival purposes and will not be accessed excluding extraordinary circumstances.
8. Enable Azure Monitor, Application Insights, and Log Analytics for all cloud resources. Define alerting rules for critical services (e.g., CPU usage, app failures, DB response time). Logs must be retained for a minimum of 90 days or as per compliance needs.
9. Charges incurred by the company's resources should be displayed separately in billing than other resources used for the company's internal operations.

3. Resources to deploy

If you provide any of the following services, you must also configure the parts specified, and any related resources:

- Azure Entra ID: describe your strategy.
- Azure App Service: Create the service instances.
- Azure Blob Storage: Create Storage Accounts, Containers and Lifecycle Policies.
- Azure Database / Azure Cosmos DB: Create server and databases and assign service endpoints.
- Development, testing and repository environment
- Azure Virtual Networks: Create the Virtual Networks and any related Subnets, Route Tables, Network Security Groups and Azure Firewall and Service Endpoint configurations.

In your diagrams use the Azure service icons provided at:
https://code.benco.io/icon-collection/azure-icons/

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4. Deliverables

As a team, you have to provide

- Detailed architecture diagrams of your solution (draw-io or Visio file)
- The necessary deployment scripts (ARM templates or Bicep script)
- Analytic report of the predicted costs in public cloud and comparison of on-premises deployment (private cloud), preferably in an Excel spreadsheet
- Presentation of the main aspects of the work done, project management overview, collaboration issues, and further work ideas.

These artifacts will be uploaded in your private GitHub repository. Each team will provide one repository, and you should invite us as collaborators. Our accounts are

iracleous
tvarsamidis

5. Project management - Milestones

The work is divided into milestones. These milestones are not mandatory, but they will help you to organize your work and time and can be followed sequentially. In practice we follow an iterative approach but since in this case it is a tutored controlled assignment we will work more or less linearly.

- **A. Selection of the services** suitable to meet the requirements.
  Therein, it is described why the proposed services are preferable over any other services that could meet the specified needs, the advantages against an on-premises configuration, IAAS vs PAAS aspects, scalability and elasticity considerations, security etc.
- **B. Detailed configuration** for each of the services.
  This includes resource groups, networking, tiers, billing models, units, capacity, security options etc.
- **C. Diagrams of the overall architecture.**
  These diagrams highlight interaction, extra needed resources like VMs, storage, networking, security, monitoring etc.
- **D. Estimated billing** per month and comparison to a totally owned solution (private cloud).
  You are expected to provide detailed calculations regarding current Azure services pricing
- **E. Presentation** of teamwork using MS-Teams.