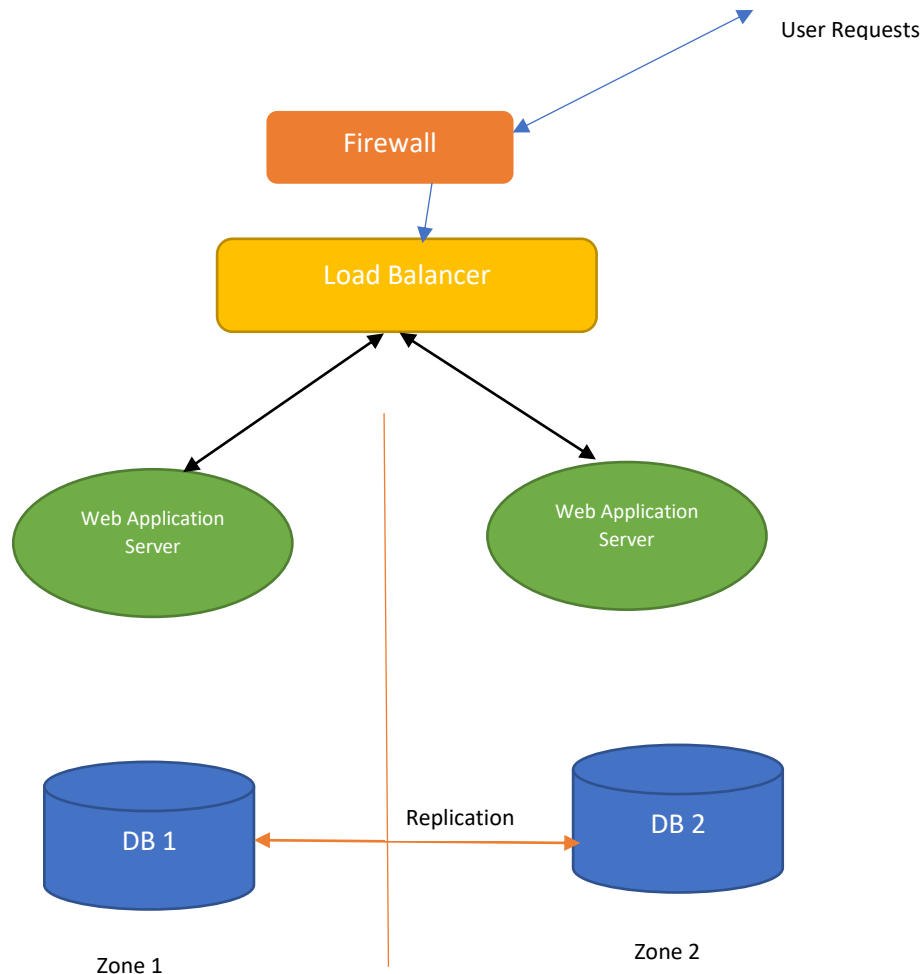


## Question 2: Cloud Architecture and Security (Theory - 30Pts)

1. You are the administrator of UNEP cloud where you run some business-critical applications. These applications sitting on an IaaS environment require high availability with an acceptable downtime of 5 minutes at any time.

Design a high-level infrastructure architecture that will cater to this situation **(5 Pts)**.  
(Consideration will be given to solutions that put high consideration for security and industry best practices and an image with the setup is desired.)



2. Augustine is working in an organization that plans to deploy several virtual machines (VMs) that will host its business-critical application to Azure. Augustine has been asked to suggest a solution to ensure that if a single data center fails, the application will not be affected. He suggests deploying virtual machines to multiple resource groups with the same availability zone.

Will the solution suggested by Augustine meet the requirement? **(5 Pts)**.

**No - The VMs should be deployed to different high availability zones**

3. You have a hybrid configuration of Azure Active Directory (Azure AD) that has Single Sign-On (SSO) enabled. You have an Azure SQL Database instance that is configured to support Azure AD authentication. Database developers must connect to the database instance from the domain joined device and authenticate by using their on-premises Active Directory account. You need to ensure that developers can connect to the instance by using Microsoft SQL Server Management Studio and the solution must minimize authentication prompts.

Which authentication method should you recommend? (5 Pts).

Windows authentication / domain account authentication

4. Which cloud approach is used by organizations to take full advantage of on-premises technology investments and allows data and applications to be shared between two environments? (5 Pts).

Hybrid cloud approach and use of tools like FileCloud that can facilitate sharing of data between on-premise and cloud – example azure stack where local resources are hypervised to integrate

5. Your company has an Azure Container Registry. You have been tasked with assigning a user a role that allows for the uploading of images to the Azure Container Registry. The role assigned should not require more privileges than necessary. What role would you assign? (5 Pts).

Contributer role

6. What are some common types of attacks that can be launched against a web application? And how would you go about ensuring that your application is not released with such vulnerabilities (5 Pts).

1. Cross-site scripting (XSS) – data encoding and validation of input
2. SQL injection -> use of stored procedures
3. Distributed Denial of Service (DDoS) attacks – block the source of request if it submits requests to the webAPP at a super-human frequency as well as use of reCAPTCHA