**Solution Design Document for**

**ATM machines in a single Region with high availability**

*Purpose:*

Technical Assignment

*Developed By:*

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*Core Requirements:*

Approximate 3000 ATMs

Location: **Single Region**

Target: **High Availability of ATM machines/Database**

***On-Premises Solution:***

1. It requires at least 2 Oracle RAC, however, for the sake of **High Availability** I’ve taken 3 Oracle RAC with replication technique.
2. There are 2 servers in each node (RAC), **Primary** and **Standby (warm boot instances)**.
3. In case of failure, the internal network switch will direct traffic to Standby (which will act as Primary server).
4. **Failover observer** is responsible for initiating a **Failover** and automatically reinstating a failed primary node as the new standby.
5. There are two replication Techniques to maintain the **data integrity**,
   1. Internal Replication within Primary and Standby with near real time updates
   2. Cluster Replication with **Dataguard Replication**
6. Load Balancer will take care of security Firewall, Routing to server based on the availability. It will equally distribute the load within the available clusters.

Diagram

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***CLOUD-based Solution Design approach:***

1. The concept is very much like on-premises solution. The core difference is SQL managed instances which comes with high availability (99.9%) with auto scaling and SLA.
2. For cloud-based solution, I’ve taken SQL Managed instances. There will be two instances per node, Active and Passive (for fallback scenarios)
3. The failover strategy will recover the primary instance which will act as Passive instance once up.
4. All the resources are deployed in 3 different High Availability Zones in a virtual Private network.
5. Zone Redundant standard Load Balance will make sure to equally distribute the load over network/among available instances.
6. Zone Redundant storage technique will make sure to take backup and sync process within the zones in case of planned and unplanned events.

***Diagram

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