# FishTank LTD: Technical Design

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Detailed design diagram

A diagram of a computer system

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**Diagram Explanation**

First you will have to use AWS migration services to migrate all information from your servers to the cloud. To migrate databases use AWS database migration services for a smooth transaction.

1. AWS: As you have requested to use AWS cloud, this is where your business will be moved to
2. VPC: Next, we will create a Virtual Private Cloud (VPC). A VPC acts like a fence around your resources, helps to isolate and keeps resources secure and allows controlled access to the internet.
3. Subnets: Within your VPC, you will have subnets – both public and private. A subnet is a range of IP addresses within a network (VPC), it is used to make networking more efficient.
   1. Public Subnet: A public subnet has a direct route to the internet, therefore is needed for the web servers. A public subnet will have to be connected to a route table and internet gateway to access the internet (discussed below)
   2. Private Subnet: A private subnet doesn’t have direct access to the internet. It will also require a NAT device to route to the internet. This is needed for resources you would be needed to keep private – databases and application servers.
4. Availability zones: Have at least two availability zones to shorten the distance between the cloud and the end user. Deploy in zones which are closer to ensure lower latency and having a back up in case one zone goes down. There will be both a public and private subnet in both
5. Internet Gateway: To connect the public subnet, you need an internet gateway and connect it your VPC
6. Route table: Gives the public subnet a route to the internet.
7. Launch EC2 instance in the public subnet – An EC2 instance is a virtual sever. It can be used to deploy and manage the web servers.
8. Load balancer – helps scale and balance the traffic coming in, this means that if one application server is receiving too much traffic, traffic will be directed to the different server. (VPC in general)
9. Autoscaling - This will help customer service as we can server 5000 customers at once, then we can also scale if needed and meet demand. Important to have a min of 1 to make sure there is a service running and a max to protect your company from DDOS attacks.
10. Launch EC2 instance in the private subnet – It be used to deploy the application server
11. Launch relational database (RDS) - launch within private subnet as it for your information only. Create a read replica to help with backing up data, this can be made in a different availability zone and can help quick disaster recovery.
12. Security Group for each component - acts like a virtual firewall to control traffic going in and out
13. IAM service – creating user profiles, what you can do and what you can’t
14. FSx for Windows File Server - provides fully managed shared storage built on Windows Server used for smooth migration

Web server Security Group Rules

|  |  |  |  |
| --- | --- | --- | --- |
| Port | Source | Destination | Comment |
| HTTPS | WebServers | Internet | Webservers use HTTPS to the internet |
| 9000 | WebServers | AppServers | PETRAweb talks to PETRAapp over port 9000 |
| 3389 | Webservers | Internet | RDP port, for administrators use |
| All | All servers | Active Directory | All servers need access to the companies Active Directory server on all ports. |

App Servers Security Group Rules

|  |  |  |  |
| --- | --- | --- | --- |
| Port | Source | Destination | Comment |
| 9000 | WebServers | AppServers | PETRAweb talks to PETRAapp over port 9000 |
| unknown | AppServers | Database |  |
| 3389 | AppServers | Internet | RDP port, for administrators use |
| All | All servers | Active Directory | All servers need access to the companies Active Directory server on all ports. |

Database Security Group Rules

|  |  |  |  |
| --- | --- | --- | --- |
| Port | Source | Destination | Comment |
| unknown | AppServers | Database |  |
| 3389 | Database | Internet | RDP port, for administrators use |
| All | All servers | Active Directory | All servers need access to the companies Active Directory server on all ports. |

**Page summary of pricing**

**Service Configuration Settings**

* AWS Application Migration Service - Number of server/s (8), Number of hour/s per server (2160) – free
* AWS Database Migration Service - Expected migration runtime hours (monthly) (1), Number of DMS Capacity Units (DCUs) (16), Availability Zone (Multiple)
* VPC - This will include the 2 NAT Gateways and the Public IPv4 Address included
* Web Server and SQL EC2 instances – Number of CPUs: 2, Memory: 4 GiB, Instance Type: c7i-flex.large, Optimize vCPUs: 2, Quantity of the Amazon EC2 instances: 4, Pricing Model: Standard Reserved Instances, Reservation term: 3
* Application Server and SQL Server EC2 - Number of CPUs: 4, Memory: 8 GiB, Instance Type: c7i-flex.large, Optimize vCPUs: 4, Quantity of the Amazon EC2 instances: 4, Pricing Model: Standard Reserved Instances, Reservation term: 3
* Amazon RDS for SQL server - Nodes (1), Instance type (db.t3.2xlarge), Utilization (On-Demand only), Deployment option (Multi-AZ), Pricing strategy (OnDemand), Storage for each RDS instance (General Purpose SSD (gp2))
* Amazon FSx for Windows File Server - Provisioned SSD IOPS (Automatic), Desired aggregate throughput (0 MBps), Desired storage capacity (4 TB)

**Service Cost Breakdown**

|  |  |  |  |
| --- | --- | --- | --- |
| Service | Monthly Cost | Yearly Cost |  |
| AWS Application Migration Service | $ 19.81 | $ 237.72 |  |
| AWS Database Migration Service | 2,337.37 | $ 28,048.44 |  |
| VPC | $ 1,168.00 | $ 14,016.00 |  |
| Web Server and SQL EC2 instances | $ 760.09 | $ 9,121.08 |  |
| Application Server and SQL Server EC2 | $ 1,148.97 | $ 13,787.64 |  |
| Amazon RDS for SQL server | $ 4,590.56 | $ 55,086.72 |  |
| Amazon FSx for Windows File Server | $ 586.06 | $ 7,032.72 |  |
| Total Service Cost |  | $ 127,330.32 |  |
|  |  |  |  |
| Roles | Rate/day | Days needed | Total Cost |
| Business Analyst | £ 400.00 | £ 15.00 | £ 6,000.00 |
| Cloud Consultant | £ 2,000.00 | £ 20.00 | £ 40,000.00 |
| Solution Archiect | £ 1,000.00 | £ 20.00 | £ 20,000.00 |
| Server Migration Engineer | £ 650.00 | £ 20.00 | £ 13,000.00 |
| Database Migraation Engineer | £ 750.00 | £ 10.00 | £ 7,500.00 |
| First/Second line Cloud Support | £ 250.00 | £ 30.00 | £ 7,500.00 |
| Third line Cloud support | £ 350.00 | £ 15.00 | £ 5,250.00 |
| Total Role Cost |  |  | £ 99,250.00 |
|  |  |  |  |
|  |  | Total Service Cost | £ 199,721.26 |

APPENDIX - Export of pricing from https://calculator.aws/#/estimate? id=ed9d4cb164cfe29a00a23ad61f93c71c8f1f73f8

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