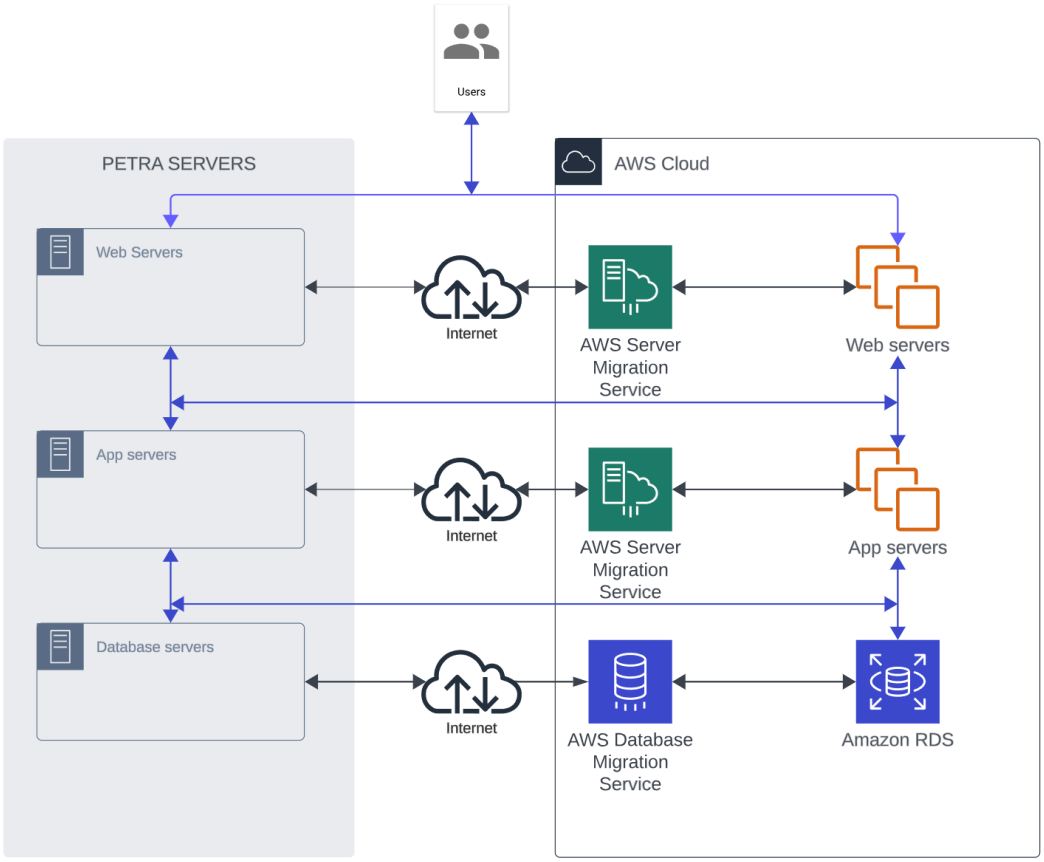
FishTank Ltd migration proposal

In this document we propose a simple solution to migrate FishTank's application (PETRA) to the AWS cloud. We give a detailed proposal outline covering cost estimates, network design and technical choices.

PETRA is a standard three-layer-application whose platform currently runs on Microsoft Windows Server (2008) and whose database runs on Microsoft SQL Server 2012. These services are both out of extended support thus an upgrade will be incorporated in the migration solution. The solution will take time constraints into time and have the process finished within a few weeks. The migration will consider the ongoing usage of the PETRA service that must experience minimal downtime for its 5000 users.

PETRA is used by users across the UK; thus, we propose utilising the AWS eu-west-2 region (London). Any service or cost estimated apply to the eu-west-2 region.

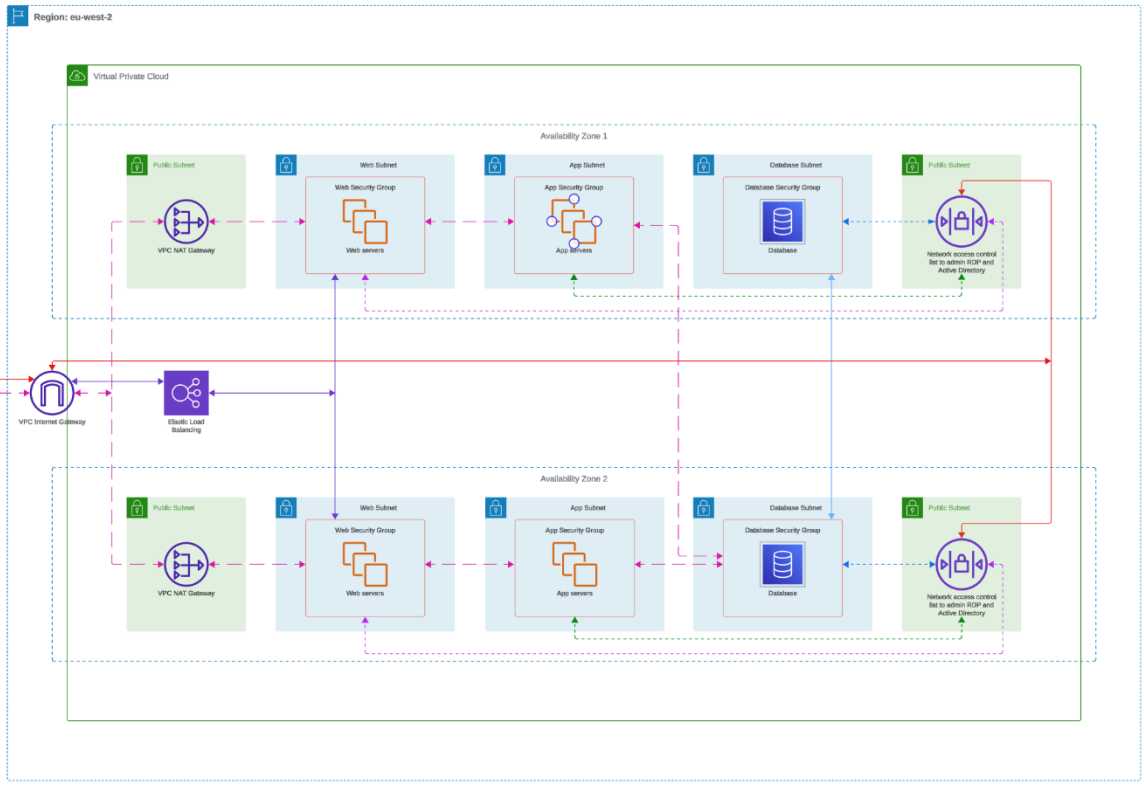
Migration Plan:



We propose making use of the AWS Database Migration Service to move data from the 2 (1TB storage, 16 GB memory, 2 CPU) database servers to 2 Amazon RDS for SQL servers running on db.m5.2xlarge EC2 instances. These instances have the same specs as the current servers, but with additional memory. RDS supports Microsoft SQL servers (2017 to 2022) thus it will be supported by Microsoft and feel familiar to the internal team. Furthermore, we can make use of Multi-AZ

deployments to replicate data to a standby database instance across availability zones. This will enhance availability and durability of the instances. We chose the c5.2xlarge EC2 instance to run the migration service on. This has a network bandwidth of up to 10 Gbps and EBS Bandwidth of up to 4750. Assuming a 1 Gbps (0.000125 TBPS) network Bandwidth and half of 4750 Mbps (2375 Mbps = 0.000296875 TBps) EBS bandwidth; we expect the movement of 2 TB of data (max capacity of current databases) to take a minimum of 2/0.000125 = 16k seconds or 4.4 days. To be conservative we estimate it will take a week. The web and app servers can similarly be migrated via AWS Application Migration Service to EC2 instances further detailed in the tables below. Again, the suggested instances have been chosen to match or exceed current server capacity. Thanks to these two services, the migration will involve minimal downtime and the move will be seamless.

Virtual Private Cloud:



We will need to set up a VPC across two availability zones to hold our instances and connections and ensure security. Wrapping our servers in security groups and compartmentalising them, allows us to enhance security by chaining the different security groups. Using a load balancer, we can spread the network traffic across resources. The security groups can be configured with the needed the firewall rules for PETRA operation. We make use Network Access Control Lists to connect our servers to Active Directory and RDP port (for administrator use).

Migration costs:

Name	Duration	Price per month
AWS Database Migration Service with: c5.2xlarge vCPU: 8 Memory: 16 GiB Storage: EBS Only	1 week	1,023.46 USD
AWS Application Migration Service for server migration	Free for up to 2160 hours	0 USD

Web servers:

Name	Quantity	Plan	Cost per month
EC2 t3a.medium | Family: t3a | 2vCPU | 4 GiB Memory • with Windows Server • with 30 GB gp3 EBS each • tenancy configuration	4	EC2 Instance Savings Plans reserved for 1 year	143.12 USD

App servers:

Name	Quantity	Plan	Cost per month
EC2 t3a.xlarge | Family: t3a | 4vCPU | 16 GiB Memory • with Windows Server • with 100 GB gp3 EBS each	4	EC2 Instance Savings Plans reserved for 1 year	564.47 USD

Database:

Name	Quantity	Plan	Cost per month
Amazon RDS for SQL server db.m5.2xlarge vCPU: 8 Memory: 32 GiB • 1 TB gp3 SSD storage each • Multi-AZ deployment	2	OnDemand usage	10,786.67 USD

VPC:

Name	Quantity	Plan	Cost per month
Amazon Virtual Private Cloud with: • 2 NAT Gateways each processing 10k GB per month • Load balancer deployed to 2 AZ's, each processing 27GB per hour, 1 new connection per minute and average 20 mins connection	1	OnDemand	1,250.31 USD

People Costs:

It is suggested to keep second/third line cloud support at hand for the whole first month and third line cloud support for the first two weeks of deployment. The migration should take place within 1 week. A business analyst should be brought in to assess the needs of the platform and its growth. A cloud consultant and solutions architect should then be able to devise the best approach and infrastructure upsizing/downsizing requirements.

Role	Days worked	Cost at end of month
Server Migration Engineer	7	7 x 650 = £4550 = $5794
Database Migration Engineer	7	7 x 750 = £5250 = $6685
First/Second line cloud support	31	31 x 250 = £7750 = $9865
Third line cloud support	14	14 x 350 = £4900 = $6240
Business Analyst	3	3 x 400 = £1200 = $1528
Cloud consultant	2	2 x 2000 = £4000 = $5094
Solutions Architect	3	3 x 1000 = £3000 = $3890

Total cost in USD: approx. $52071

Total cost in GBP: approx. £40897