## Current Infrastructure, Dependencies & Challenges

Petra has a three-layer architecture with the layers being web, application, and database. The application currently operates on Windows Server 2008 and SQL Server 2012, which are both outdated.

All the servers on Petra are dependant on Active Directory and DNS is a significant part of the infrastructure. The firewall rules include HTTPS access for Web Servers, App Servers, and Database to the internet through the RDP port 3389 for administrative use and Port 9000 is used for communication between Web Servers and App servers.

However, there is an unknown port for communication between App Servers and the Database.

The application servers S006-S009 have 4 CPUs, 8GB memory and are 100 GB storage so are resource intensive whereas the web servers S002-S005 have lower compute requirements. S001, S010 and S011 are domain controllers and print servers so rely heavily on the on-premises environment.

## Migration Planning AWS Services

The servers will be migrated to EC2 instances. For the operating system it will be required to upgrade from Windows Server 2008 to a more modern option that is supported by AWS for example Windows Server 2022. Similarly, the database which is hosted on Microsoft SQL Server 2012 will be migrated to the managed database Amazon RDS.

All servers will be moved from Active Directory to AWS Managed Microsoft AD to ensure the maintenance of identity management. The network switches will be replicated as Virtual Private Cloud and the Firewalls replaced by Security Groups and Network ACLs.

The data in Shared Storage (SAN01) will be migrated to Amazon FSX as it is a Windows file system making it suitable and increasing the ease of migration.

## Cost of Migration

The total cost of AWS resources running in the cloud came up to 22,268 dollars (£18,000) (table 1) and the total costs of labour amounted to £232,400 (table 2). So, the total cost of moving to cloud is estimated to be £250,400 in the first year.

## Appendix

Table 1: Migration of Asset list to AWS resources and Total Annual Cost

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Asset Tag | Name | AWS Resource | Type | Total Annual Cost (USD) |
| S001 | Domain Controller | AWS Managed Microsoft AD | AWS Managed Microsoft AD | N/a |
| N001 | Firewall | Security Group & Network ACL | Security Group & Network ACL | N/a |
| S010-S011 | Print Servers | EC2 Instances (Windows) | t3.micro | 942.60 |
| S002-S005 | Web Servers | EC2 Instances | t3.medium | 2854.32 |
| S006-S009 | Application Servers | EC2 instances | t3.xlarge | 4951.35 |
| S012-S013 | Database Servers | Amazon RDS for SQL server | db.t3.medium | 2773.08 |
| SAN01 | Shared Storage | Amazon FSX | Windows File Server | 3941.52 |
| N002-N003 | Network Switches | Amazon VPC | Amazon VPC | 6804.00 |
| S001 | Active Directory | AWS Managed Microsoft AD | AWS Managed Microsoft AD | N/a |

Table 2: Cost of Labour

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Role | Rate (£) | Monthly Cost (£) | Duration (months) | Total Cost (£) |
| Business Analyst | 400 | 12000 | 3 | 12000 |
| Cloud Consultant | 2000 | 60000 | 3 | 60000 |
| Solution Architect | 1000 | 30000 | 3 | 30000 |
| Server Migration Engineer | 650 | 13000 | 6 | 39000 |
| Database Migration Engineer | 750 | 15000 | 6 | 45000 |
| First/Second Line Support | 250 | 3000 | 12 | 36000 |
| Third Line Support | 350 | 4200 | 12 | 50400 |

Diagram 1: Network Design

A screen shot of a computer

Description automatically generated