

# Implementing an AWS cloud migration to facilitate more engaging shopping behaviour using location technology



**A company using smartphone technology to enable brands to communicate with customers in real-time needed to migrate their digital platform to a highly available, fault-tolerant and scalable AWS environment, using AWS CloudFront for local web caching. They turned to BBD, an AWS Standard Consulting Partner and CloudFront Global Content Delivery Network Partner, for a customised cloud solution.**



## Objectives

- › Understand the current and future AWS network design and application architecture requirements
- › Restructure the AWS network design to a more suitable AWS environment
- › Facilitate South African web caching through AWS CloudFront
- › Architect a low cost, highly available and scalable solution



## Benefits

- › High availability of the application and database
- › Scalability to manage future high traffic loads
- › Security of client data
- › Monitoring and alerts on operational issues utilising AWS CloudWatch



## Overview of the solution

The client's turn-key solution allows a brand to drive shopper engagement and loyalty, while providing detailed shopper analytics. Customers of the client who trade in the physical world can now be provided with the same insights and understanding of their environment, shoppers and tenants as a customer in the online world. Having access to a shopper's data is integral in leveraging the unique understanding of a shopper's movements and preferences, and was achieved through a combination of software, hardware and infrastructure.

Prior to the client engaging with BBD they were running a digital platform utilising an AWS EC2 instance, developed using modern web frameworks and an open source relational database. This did not provide for high availability or scalability.

The client was running the full web stack on the same AWS instance - not best practice for building fault-tolerant systems within AWS, while no web caching mechanism was in place to obtain the website data locally. There was also a requirement for a network design that encompassed strict security measures, due to the customer data being dealt with.

One of BBD's first requirements was changing the manually configured backup procedures to a robust and reliable automatic backup service provided by AWS. We utilised Amazon's Relational Database Services (RDS) which is easy to set up, operate and scale.

The client also required bulk emails to be sent from their hosted instances, and operational alerts had to integrate into their Slack Chat channel, to enable them to receive alerts for particular AWS resource metric alarms and backup events. The integration into the client's Slack Chat channel was configured using a Lambda function and Amazon's Simple Notification Service, to enable alarms to be sent to the channel for specific resource metrics. The Amazon Simple Email Service SMTP interface has been configured to send out bulk emails from the instances.

The domain is hosted within Amazon's Route 53, which has a 100% availability SLA.

An Amazon Elastic File System (EFS) volume was created for storage of dynamic website data together with an EFS-to-EFS backup solution. The automatic backups of the RDS database and the EFS volume have been configured to run daily. AWS's simple notification service is configured to email the output of the backup events.



## Approach

BBD used the following approach to address the client's requirements:

### Network design

A restructuring of the client's AWS network design was done, keeping the following criteria in mind:

#### High availability

- › Through the implementation of one Amazon Virtual Private Cloud (VPC) containing two availability zones, with each zone comprising a public and a private subnet - resulting in four subnets: two private and two public

#### Future network expansion and potential hybrid network

- › The IP ranges for the VPC and subnets had to be considered and compared to the client's on-premises IP ranges. In line with best practice recommendations, BBD utilised non-overlapping ranges to cater for a potential future on-premises AWS Hybrid network design

#### Security

- › The network was divided into public and private subnets for adequate security measures to be put in place, with additional subnets in a different availability zone ensuring high availability and resilience
- › The private subnets are used to store the application and database and are not directly exposed to the internet, with restricted access to the application instances via the load balancer and bastion hosts

- › Security groups for the private subnets ensure stringent access to resources by allowing access from only the bastion hosts and elastic load balancer
- › The RDS security group allows access from only the required instances in the AWS private subnets
- › The bastion host, which has been set up in the public subnets, allows secure access to the application and database instances in the private subnets

## Client's application and database migration

### Database migration

- › The relational database was migrated into Amazon's RDS, which provides the benefit of a highly resilient and easily scalable service, configured for daily automatic database backups into Amazon's S3 storage platform
- › RDS instances deployed in a multi-AZ fashion have a 99.95% availability SLA, catering for high availability
- › Backups were configured using Amazon's RDS scheduled backup

### Application scalability and high availability

- › We implemented an internet-facing load balancer and auto-scaled the Amazon EC2 instances
- › The auto-scaling group manages the number of EC2 instances to be started, according to the capacity required. This setup will also provide high availability
- › AWS provides a 99.99% availability SLA for EC2 deployed in a multi-AZ fashion

### Local caching of website data

- › Amazon's CloudFront was implemented to gain the benefit of the local caching of website data, as well as the highly-resilient Amazon backbone network for superior performance and availability for their end users



## Impact of BBD's partnership

Our certified AWS professionals were able to use their knowledge and experience to quickly leverage the ability and scale of the cloud and migrate the client's existing applications, designing a customised cloud solution for the client.

Minimal to no downtime during the migration also resulted in operational cost savings.



## Contact us

For more information and to find out how BBD can enable your business in the cloud, contact Dieter Rosch.

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