Final Report for Cloud Migration

Customer Name: BallotOnline

Vendor Name: ASK, INC.

Customer Representative: Trent Broderick

Professor Esquire

Statement of Work

This project is born of the RFP submitted by BallotOnline to build a cloud ecosystem similar to their on-prem ecosystem but highly scalable, secure and redundant. ASK, INC, is preparing this Statement of Work after winning the bid and picked by BallotOnline to prepare Cloud Migration Services.

The goals of this SOW are to ensure both ASK, Inc and BallotOnline are clear on the overall mission, work and desired outcomes for both parties. The SOW Scope remains focused to the Cloud Migration and all services related to this migration.

**Services, Expectations and Requirements**

BallotOnline expects the services and requirements as mentioned in the ASK, INC. response to RFP. BallotOnline expects ASK, INC to use Amazon Web Services as the sole Cloud Provider. Furthermore, BallotOnline expects Zero-Downtime (99% Uptime Guaranteed), highly available and cost-effective solutions as provided by Amazon and their Pillars for a Well-Architected Framework. Migration services are not limited to but include:

* Management of Current Infrastructure
* Complete migration of infrastructure, Networking and Storage of current environment to the Amazon Web Service Cloud.
* Secure and encrypted transfer of all data and absolutely no leakage of sensitive data.
* Data remains Geo-Spatially Sensitive
* Management and training of infrastructure and Ballot Online Staff post migration.
* Weekly reports on Uptime, Budget and other pertinent information
* A complete Disaster Recovery Solution that allows data to still be Geo Spatially intelligent but also able to be fully recover in case of emergency to eliminate any downtime.
* Complete Compliance to all policies related to data protection and integrity as required in the RFP are also expected.
* Any deviations from ASK INCs Response to RFP are to be promptly reported and are subject to review by Ballot Online.

BallotOnline assumes the Ask, Inc has maintained the following corporate structure:

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Any changes in the structure must be reported immediately to BallotOnline. It is required ASK, INC. report a list of all employees working on this migration due to the nature of the data being migrated. There is zero-tolerance for violation of failure to report organizational changes that effect BallotOnline in any way.

It is assumed that the following schedule will be maintained for this migration: A screenshot of a cell phone

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Any changes to the above schedule must be communicated as soon as possible with a revised schedule. BallotOnline must be kept in the loop on all changes. Any budgetary changes to this project due to delays are subject to review by BallotOnline.

**Service-Level Agreement**

This agreement is a Service-Level Agreement ("SLA") between vendor "**ASK, INC”** and customer "**BallotOnline**" for cloud hosting, migration, and operational services. This SLA is valid until superseded by a revised agreement approved by all stakeholders in writing.

**Overview**

The purpose of this SLA is to ensure that both parties are clear about the commitments for the cloud hosting, migration, and operational services that are subject to this SLA. This SLA provides:

* Clear and measurable descriptions of services provided
* Key metrics used to establish SLAs
* Establish clear understanding of expected service performance

# Stakeholders

The following are the primary stakeholders for this SLA:

Vendor: **ASK, Inc.**

Customer: **BallotOnline**

# Services Agreement

ASK, INC. is the sole migration provider of BallotOnline. ASK, INC. will migrate BallotOnline to the cloud provider, Amazon Web Services. This migration is a large enterprise scale, integration migration that requires the best practices currently provided by AWS in regard to a Well-Architected Framework, Privacy, Data Integrity and Geo-Spatially intelligent data that does not leave the bounds of the county’s borders.

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## Services Scope

The following services are within the scope of this agreement:

* Full Infrastructure Migration
* Data Migration
* Data Encryption and Protections
* Full Network Migration
* Training
* Full Compliance as Listed in the Ballot Online RFP.

## Vendor Responsibilities

All Things listed in the above Services Scope, including all services listed in the Response to RFP from ASK, INC as deemed satisfactory by the BallotOnline Executive Leadership.

## Customer Responsibilities

The Customer BallotOnline is responsible for ASK, INCs access to our systems. BallotOnline must vet all employees accessing sensitive data and grant access. BallotOnline must also ensure that ASK INC is properly supported during this migration to ensure a smooth transition.

**Acceptable Use Agreement**

BallotOnline is happy to employ ASK, INC to help migrate our systems from On-Prem to the cloud. As it has been mentioned several times, the data being migrated is sensitive and cannot be leaked, abused or used in any unlawful way. It is expected of all employees that the data is **not**:

* Used in ways that is harmful, illegal, threatening, invasive of privacy or used in such a way that can harm the image or brand of BallotOnline or the users who data is stored with BallotOnline
* Transmitted through unsecure channels or on plain paper. This includes but is not limited to E-mail, Fax, telecommunication devices, Instant Message, etc.
* Infected with viruses, malware or any other type of malicious code that can impact the data or the users accessing the data.
* Used in a way that steals the intellectual property of BallotOnline.
* Used to violate public trust laws, privacy laws, or data security laws.
* Used to Interfere with the elections of U.S. and foreign counties.

Furthermore, it is expected that anyone who has access to the internal systems of BallotOnline does not engage in conduct that can create downtime or vulnerabilities in our system. Engaging in behaviors such as DDoS attacks, creating offline easy access copies of data, selling data to outside companies, using bots or spiders to parse data to target specific individuals is strictly prohibited. Any violation of the acceptable use terms will be met with litigation and immediate termination of this contract. It is expected of all parties to comply with all warrants, subpoenas and/or orders that come from direct violation of this agreement.

# Services Management

ASK INC is responsible for all managed services and managing all migration services during the migration. Post-migration there may be need for ASK INC to continuing managing services until BallotOnline Staff is trained to manage the same systems with the same if not better efficiency as ASK, INC.

## Service Availability

Website availability 99.99% per 24-hour period or 99.99% over a rolling 30-day period, website migration completed within 90 days from contract signing, additional compute capacity provisioned within 5 minutes if CPU use is greater than 85%. Additional compute if network saturation reaches 75% for additional load balancing. Larger machines deployed if CPU usage averages 89% over a 30 day rolling period.

## Service Requests

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Low Score: 1 Hour minimum response time

Medium Score: 45-minute minimum response time

High Score: 25-minute minimum response time

**Support for Cloud Operations**

Cloud Operations are an integral part of BallotOnlines mission to be Cloud Native. This policy concerns the resources needed to provide a fully encompassed cloud solution. This includes data storage, processing, management, helpdesk and other related functions for successful cloud deployments. All training documents, polices, and related usage guides are to be kept in a VPN protected drive so only employees of both BallotOnline and ASK, INC can access the needed files.

As mentioned in the Acceptable Use Policy, there is to be no transmission of data in an unencrypted and unsecure way. In addition, there is to be no un-purposeful or purposeful attempts to sell, destroy or change any of the data for any reason what so ever. Any loss of data must be reported within one hour of loss. Any issues, violations or roadblocks of or caused by this agreement are also to be reported as soon as possible for immediate mitigation.

Ask INC is responsible for maintaining a helpdesk for all employees to use when needed. This helpdesk needs to be able to address any and all issues related to this cloud migration. Post migration it is asked that the help desk stay active for a minimum of one year.

BallotOnline is not liable for any loss of data, miss use of data, tickets related to the help desk or management of cloud infrastructure during this migration period. Ask, INC will be liable for any issues both infrastructure, data or public relations related that are directly caused by this cloud migration.

**Lab Report for CloudWatch**

CloudWatch is an amazing tool that can help a customer monitor their AWS cloud health. In this assignment, I expect to learn not only how to implement AWS CloudWatch into my current cloud environment but also how to interpret the data it processes. This is a major skill to have due to the real-world application of a program such as platform and need to have minute to minute cloud health checks. If there are any challenges in this lab, they will spring from myself being unfamiliar with the AWS Console.

Creating a CloudWatch Dashboard is fairly easy. Within a few clicks, I had a dashboard within CloudWatch ready to be built out and customized. It is important to remember to only work within the console of the service you need. I made an early mistake by searching for dashboard sin the entire AWS console and not CloudWatch.

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Learning how to configure a CloudWatch dashboard was incredibly insightful. Amazon provides several ways to understand, view and ingest data. Each viewable graph includes several different organized services related to your environment to help understand a multitude of different statistics.

During the lab, I could not find one of the statistics needed to be measured “HTTPCode\_ELB\_5XX”. I was uncertain why I could not find this statistic as I checked my ELB and instances. Everything was connected, working and I was in the correct region. I may need to dive in deeper on my own time to better understand why this statistic did not show on my screen.

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Creating a billing dashboard is much similar to the other dashboard created previously in the lab. It is interesting to see that a customer can view estimated billing for services beyond just EC2 and the Classic ELB such as S3 and Data Transfer. The simple point and click, matched with great detailed explanations of statistics in clearly defined menus makes this process extremely user friendly.

This lab continues to add on to the practical skills needed by Cloud Architects in todays AWS centered world. There is much more practical testing I need to do with machines racking up bills for me to truly understand the powerfulness of the CloudWatch tool, but this so far has been a great introduction.

**Second Lab for Causing Outages**A screenshot of a cell phone

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Based on this lab, I expect this dashboard to light up with different numbers and statistics. Prior to the lab, I opened up the Elastic Load Balancer in 5 different tabs to test out this dashboard. It will be interesting to see how downtime and errors having cause this dashboard to react.

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The dashboard changed in that there were more connections which is expected when establishing a connection to a page 25 times. However, the number of errors did not change which I found very interesting. Other events that could change the Dashboard are hosts going down or offline, needing to scale up, users downloading or uploading data to site and even more navigation to fake or broken pages.

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Over the course of the class, I changed computers therefore destroying my keys. I attempted to recreate the instances to no avail, so I was unable to recreate an unhealthy instance. I left one instance up and completely took down the other instance to simulate 1 instance online and 1 instance down.

In order to minimize outages, it is important to always have CloudWatch up with alerts on to understand cloud health. As a rule of thumb, having an auto-scaler is extremely helpful as well. When I ran into a snafu while simulating a down instance, my Elastic Load Balancer automatically spun up a second instance.

This design being smaller and simple in size makes it very easy to manage in this manner. In larger production environments, such as the one BallotOnline is anticipating in using, there will be more alarms, ELBs, and redundancy built in to better protect the systems against inundation and downtime.