ENPM665 – Midterm

Version 2.2 – Sept 27th 2022

Background

COBRA KAI

STRIKE FIRST - STRIKE HARD - NO MERCY

Cobra Kai is a successful karate dojo in the Los Angeles, California area. Despite meager beginnings the dojo quickly established itself as one of the top dojos in California, and the United States. With the demand for spots in the dojo high and COVID-19 restricting in person training sessions Johnny Lawrence, the founder of the Cobra Kai dojo, has created a new online platform to stream live and on-demand training sessions to members all around the world, something truly disruptive in the karate world. On a meager budget Johnny and his students quickly deployed their online karate class training program with a number of servers in their on-prem data center (a closet in Johnny's office.) Demand quickly overtook the processing power of their on-prem data center and they also have concerns that Johnny's rival Daniel LaRusso or one of his associates may be trying to illegally gain access to the platform and the data contained within the platform. With lack of funds to build their own data center Cobra Kai has decided to move their operations to the cloud and have hired you to help ensure their platform moves to the cloud in a safe and secure manner.

Cobra Kai Leadership / Development Team

- **Johnny Lawrence** – The founder of Cobra Kai and the visionary disrupting karate and karate training with the introduction of his streaming platform for karate training
- **Miguel Diaz –** Chief Operating Officer. Miguel is the person in charge of daily operations for Cobra Kai and its streaming platform. Note he is not technical
- **Aisha Robinson –** Chief Information Security Officer. Aisha is the enforcer for Cobra Kai both in person and online. Her security and risk focused mindset helps her discover and mitigate risks before they are exploited. She is the reason you were hired to help with this move to the cloud.
- **Eli "Hawk" Moskowitz** – Chief Information Officer. "Hawk" is the brains behind the development of Cobra Kai's streaming platform
- **Demetri** – Web developer. The head developer for implementing "Hawk"'s vision.
- **Bert** - System administrator. Although small in stature Bert is highly skilled when it comes to technical items

Technical Background

Capitalizing on the massive demand for Cobra Kai karate training Cobra Kai developed their karate training-on-demand platform to offer live and streaming karate training with sessions taught by Johnny, Miguel, Aisha, and "Hawk". The platform has "gone viral" with massive demand and there have been outages due to this wild popularity.

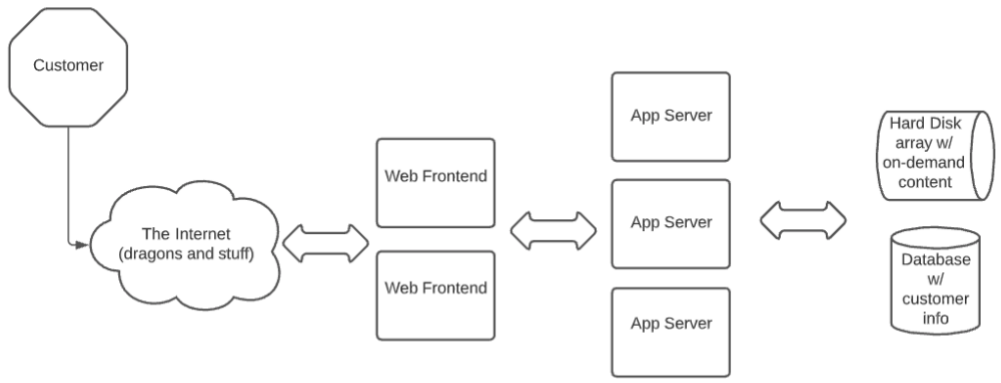
The development team often "flies by the seat of their pants" when updating or troubleshooting issues with the platform and does not have a formalized development process or a patching process for the operating systems and software that hosts their training platform.

The site does process credit cards. When asked about their PCI compliance they look confused and then threatened to break the interviewer's arm.

Current Issues to Consider

- Cobra Kai does not currently have a patching strategy
- Cobra Kai does not currently have a backup strategy
- Cobra Kai does not currently have an account permission strategy, every use has the ability to run privileged commands on the web server if they want to
- Their entire website infrastructure is highly vulnerable to DDoS, hardware failures, and human error. It runs in a closet for crying out loud.
- The website has experienced DDoS attacks and compromise attempts they suspect comes from a rival dojo ran by Daniel LaRusso who with his deep pockets has become a persistent threat against Cobra Kai's l IT operations
- Customers have complained about slow streaming, downloads, and order processing
- Cobra Kai's platform is processing credit card data and also stores customer PII (name, phone, email, address, and additional details about the customer)
- Cobra Kai's corporate IP range is 129.2.0.0/16 (it's not really but pretend it is)

Current Website Architecture



Customer comes over the Internet and connects to one of the front-end servers via round robin DNS. Data/actions are then sent to one of 3 app servers for processing and the app server will either record data in a master database or sending streaming on-demand content stored on a hard disk array back to the user

The Assignment and Requirements

Redesign the Cobra Kai application to take advantage of the benefits of moving to the cloud, especially with regards to security. For example, the entire site is currently running from a single rack of servers inside a coat closet -- that's not very resilient. How can the site be redesigned to take advantage of a cloud environment so it can scale up to handle the load if someone Daniel LaRusso attempts to stage a DDoS attack against the platform?

This should be a high-level document/presentation where you make recommendations on how to rearchitect the existing Cobra Kai application to move it to the cloud in a secure manner. Think about things like resiliency, identity and access management (IAM), protecting data, compliance, secure system administration and coding practices.

What you submit should be a short executive summary (a few pages) or a short presentation (Powerpoint or PDF) to give a high-level overview to the Cobra Kai leadership to gain buy-in for your plan. **Focus on the concepts and strategy**, we'll get to the tactical and the how to actually implement soon enough. ☺

If you need assistance with developing charts and diagrams for this midterm, Lucidchart is available for free for all UMD students. More information: https://umd.service-now.com/itsc?id=kb_article_view&article=KB0010491 (Lucidchart has AWS, Azure, Cisco, and other computing icons already pre-loaded making it easy to diagram out examples.) Some other options are https://www.cloudcraft.co/, https://creately.com/, and https://draw.io/

Due Date:

The project is due Friday October 21st @ 11:59pm!

Review the syllabus for information on the class late policy. **Don't wait until the last minute to get started on this midterm project!**