Securities Tracking, Observation, and Computational Knowledge System:

Documentation and Development Report

Sean Gallagher

Southern New Hampshire University

CS-340: Client-Server Development

Securities Tracking, Observation, and Computational Knowledge System:

Documentation and Development Report

Professionals in the Financial Services sector must track and account for a milieu of statistics and data in the course of the daily conduct of business. Fortunately, computer systems present an opportunity to facilitate the acquisition and analysis of this knowledge in new and compelling ways. The Securities Tracking, Observation, and Computational Knowledge System[1] is one such system—one which aims to revolutionize the financial services sector. This report documents the system, its features and functions, and the interface it exposes to enable those ends. The system is built on Node.js in a modern Linux operating environment, familiar to both administrators and engineering teams. This allows developers to more flexibly move from back-end to front-end development and focus on creating powerful, responsive interfaces for their users.

This documentation consists of two sections. The first covers administration of the system back end through the life cycle of included data. Following a discussion of database initialization and indexing, the report will cover the basic command line tools included with the product and their applications in manipulating and validating the data stored within the installed system. The second section details the Web Service API. This API—which is intended to be the primary interface for both daily use and administration of the system—includes endpoints for basic database manipulation and the two specified reporting interfaces. Each section includes detailed descriptions of operations involved in system administration, as well as screenshots illustrating operations and their results. Names of variables, options, and executable scripts or programs are set inline in `mono-space`. Additionally, commands meant to be entered directly at a Linux or MongoDB shell prompt follow the convention:

```
$ command [optional value] <mandatory value>
```

---

1. Yes, that's quite a mouthful. We know; we're working on it.

Installing, Initializing, and Adminstering the System

The Securities Tracking, Observation, and Computational Knowledge System[2] is built on MongoDB, a document-oriented NoSQL database system, and Node.js, a server-side runtime for modern JavaScript based on Google's V8 JavaScript engine. It is designed and tested to run on modern Linux platforms—development and testing was done on Ubuntu 20.04 LTS, though any recent Linux distribution should suffice. As a full discussion of the pertinent concepts relating to each of these technologies could fill several textbooks, this document assumes the prospective administrator is familiar with installing and maintaining a Linux system; installing, configuring, and securing a MongoDB server instance; and basic usage of Node's `npm` package manager. Once these dependencies are met, issue the following command to download the system files:

```
$ git clone --depth 1 https://github.com/seangllghr/cs340-project
```

As with any `git clone` operation, you can specify a custom installation directory at the end of the command. Once the files have been downloaded, enter the installation directory and run

```
$ npm install
```

to install the necessary Node dependencies.

---

2. We really need a new name for this…