MICHIGAN STATE UNIVERSITY

Project Plan AMAP: Automated Malware Analysis Platform

The Capstone Experience

Team Accenture

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From Students…
…to Professionals

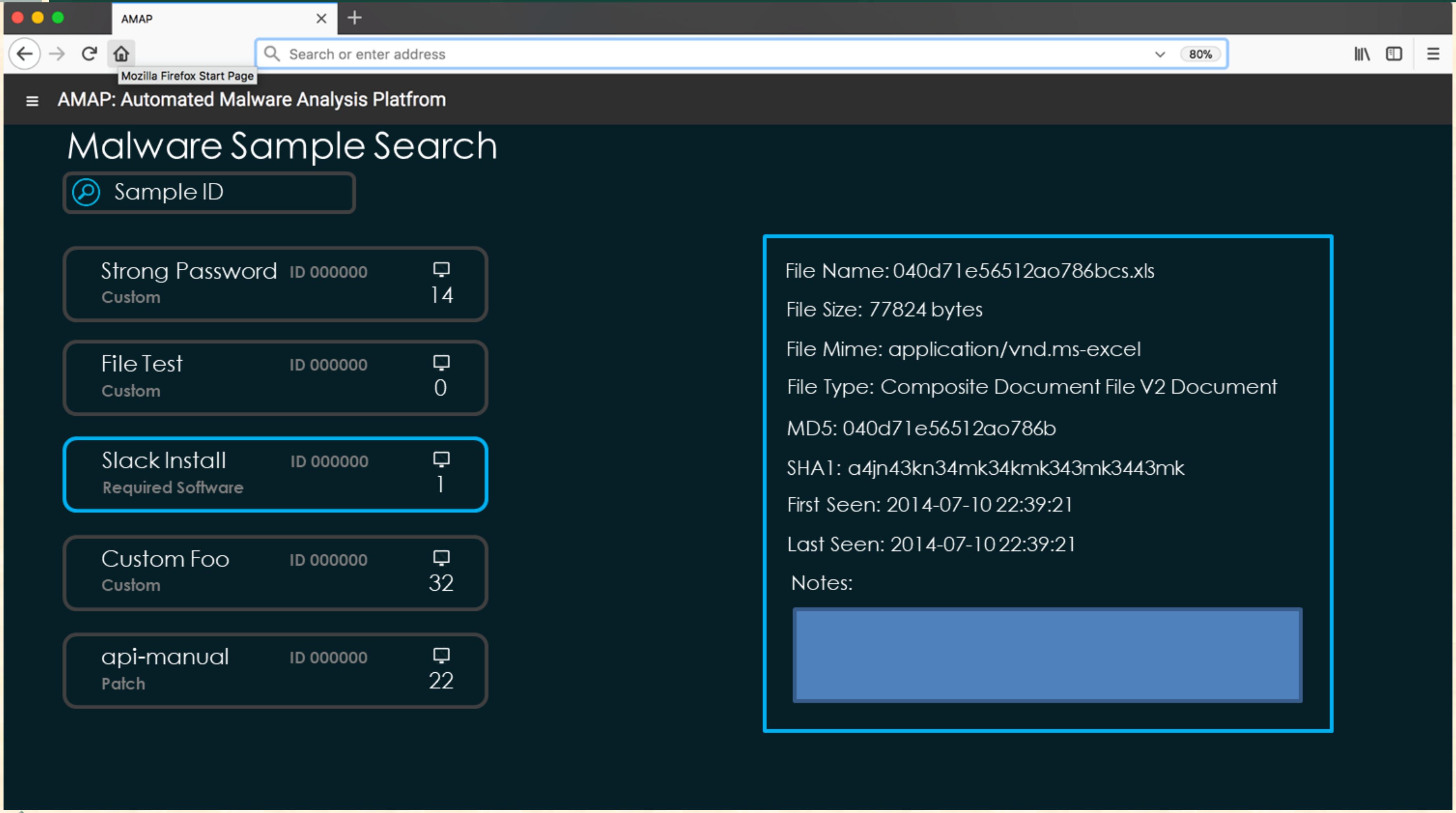
Functional Specifications

- Automate the process of practically analyzing malware samples
- Perform analysis on a large volume of malware samples
- Focus on basic static and basic dynamic analysis
- Record results of analysis and display information to a dashboard

Design Specifications

- Series of modules used to analysis each malware sample
- Status dashboard displays information on the state of the AMAP system
- Malware search page allows users to see specific malware sample information
- Wizard-style UI to add, edit, or remove modules

Screen Mockup: Malware Search



AMAP: Automated Malware Analysis Platfrom

Malware Sample Search

Sample ID

Strong Password	Custom	ID 000000	14
File Test	Custom	ID 000000	0
Slack Install	Required Software	ID 000000	1
Custom Foo	Custom	ID 000000	32
api-manual	Patch	ID 000000	22

File Name: 040d71e56512ao786bcs.xls

File Size: 77824 bytes

File Mime: application/vnd.ms-excel

File Type: Composite Document File V2 Document

MD5: 040d71e56512ao786b

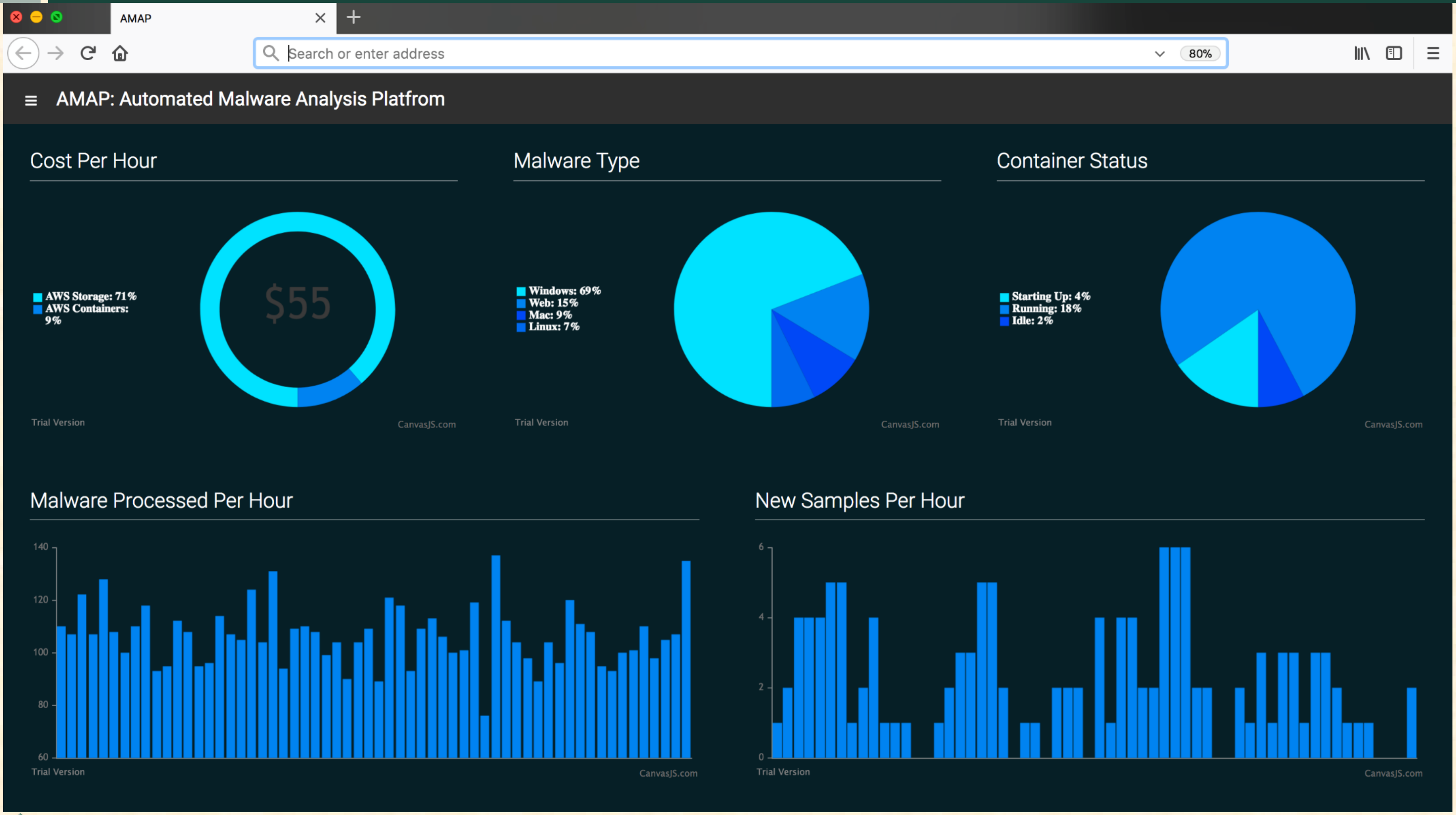
SHA1: a4jn43kn34mk34mk343mk3443mk

First Seen: 2014-07-10 22:39:21

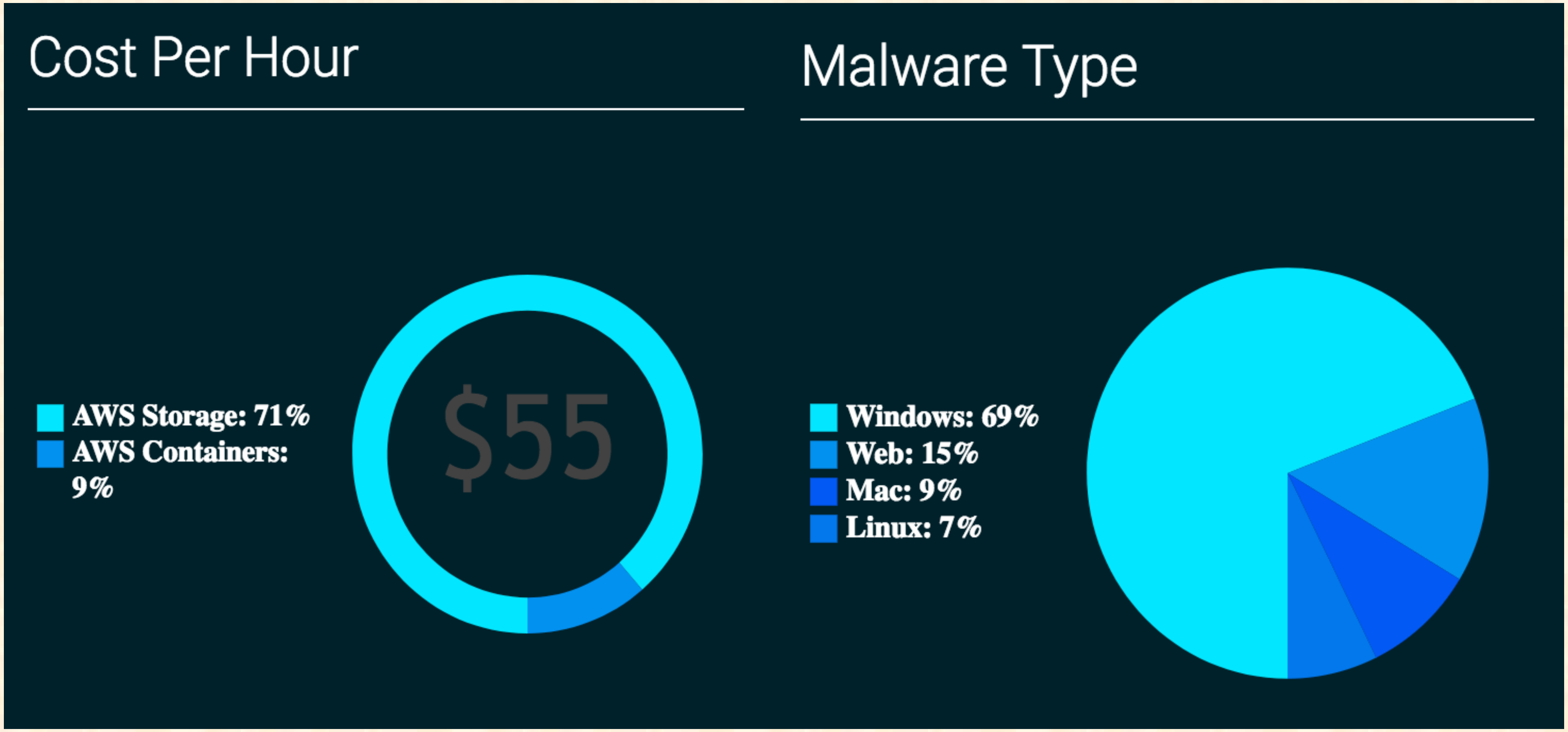
Last Seen: 2014-07-10 22:39:21

Notes:

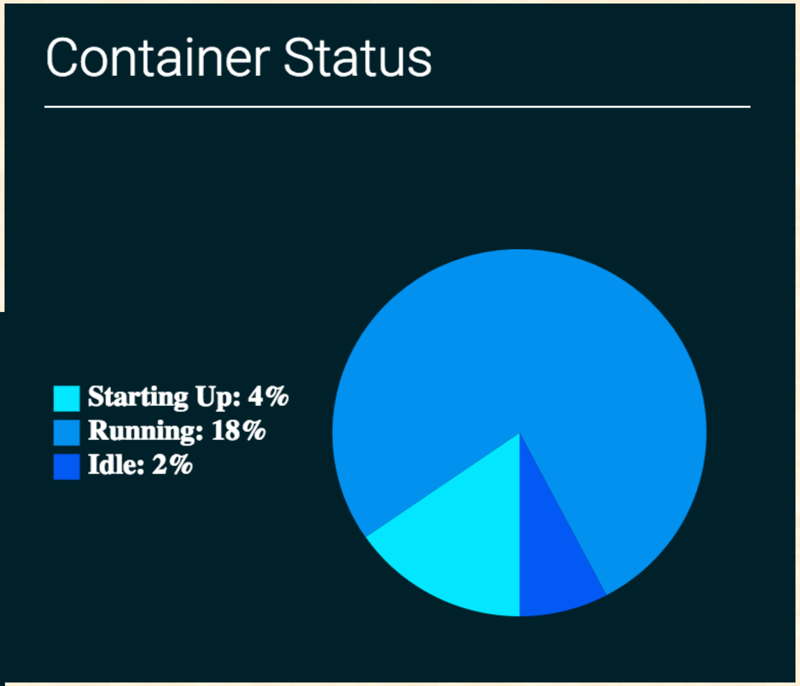
Screen Mockup: AMAP Dashboard

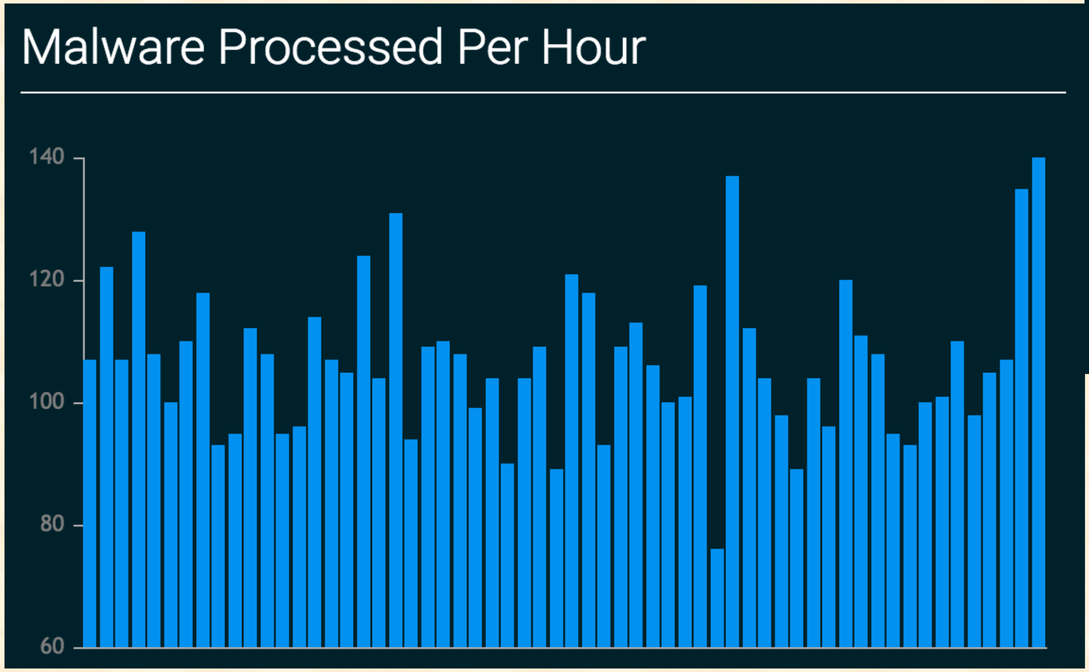


Screen Mockup: AMAP Dashboard



Screen Mockup: AMAP Dashboard

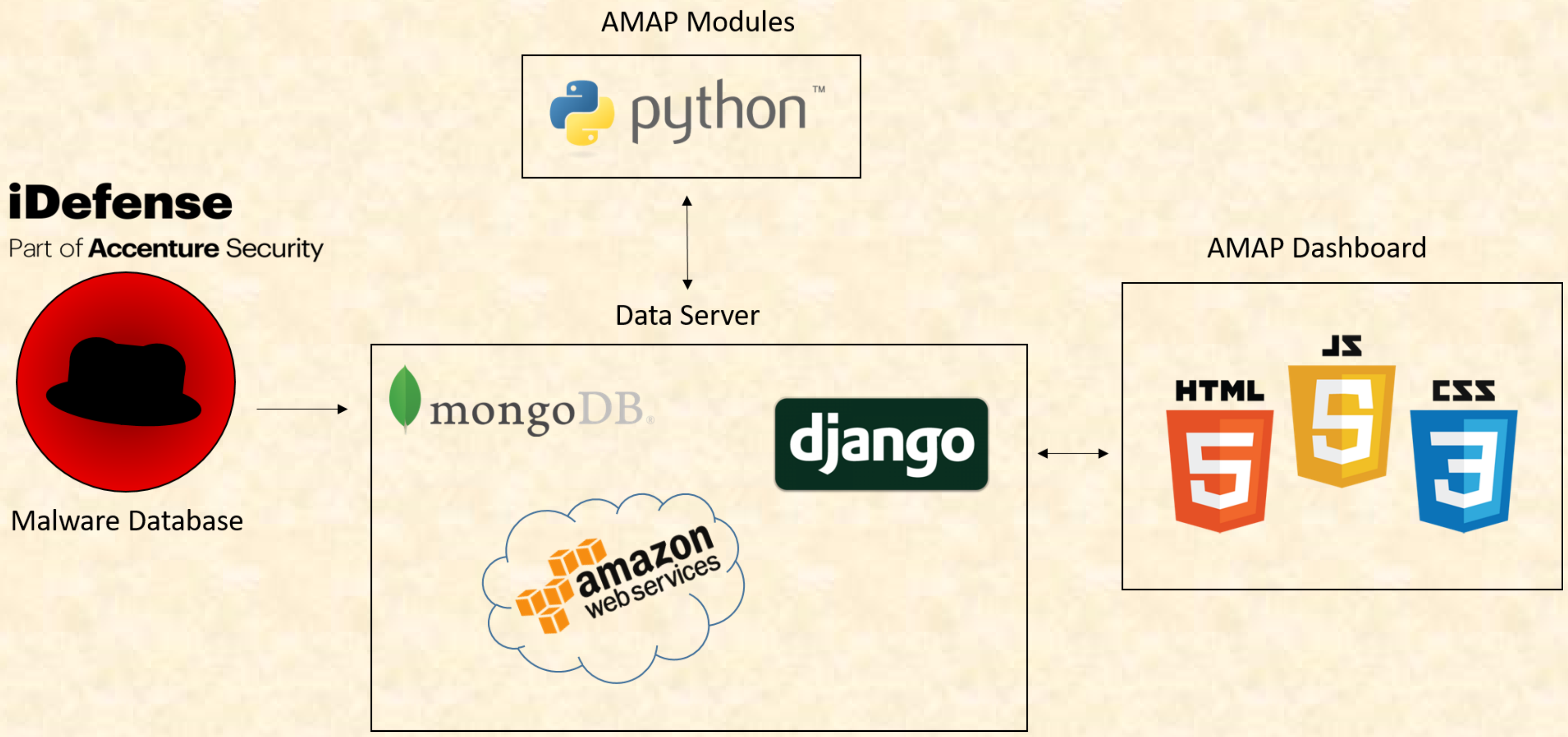




Technical Specifications

- Basic static analysis
  - Provides information about functionality
  - Produce simple network signatures
  - Ineffective against sophisticated malware
- Basic dynamic analysis
  - Observe malware behavior after executing on system such as encrypting files or changing file names
  - Takes place in a controlled environment such as VM or sandbox

System Architecture



System Components

- Software Platforms / Technologies
  - iDefense IntelGraph API
  - iDefense Malware Repository
  - mongoDB hosted on AWS
  - Python/Django -- PyCharm
  - HTML, CSS, JavaScript

Risks

- Processing a large quantity of samples
  - System needs to handle an average of 300 thousand per day
  - Using multithreading to allow many modules to be run concurrently
- Categorizing malware based on type
  - Malware must be classified based on detection signatures, byte patterns, and other information
  - Undergoing training from the client to learn how to categorize malware based on these criteria
- Getting information from dynamic analysis
  - Malware samples are executed in a VM or sandbox environment and information about their effects must be recorded
  - The client has extensive knowledge about how to perform this method of malware analysis
- Determining when a sample is finished processing
  - Malware analysis can sometimes produce as a result encoded payloads that require further analysis
  - Client can provide information about when this situation occurs and small scale testing can be used to determine what kinds of samples might cause this

Questions?

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