MICHIGAN STATE UNIVERSITY

Project Plan

Next Generation Malware Detection, Clustering and Heuristics

The Capstone Experience

Team Proofpoint

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From Students…
…to Professionals

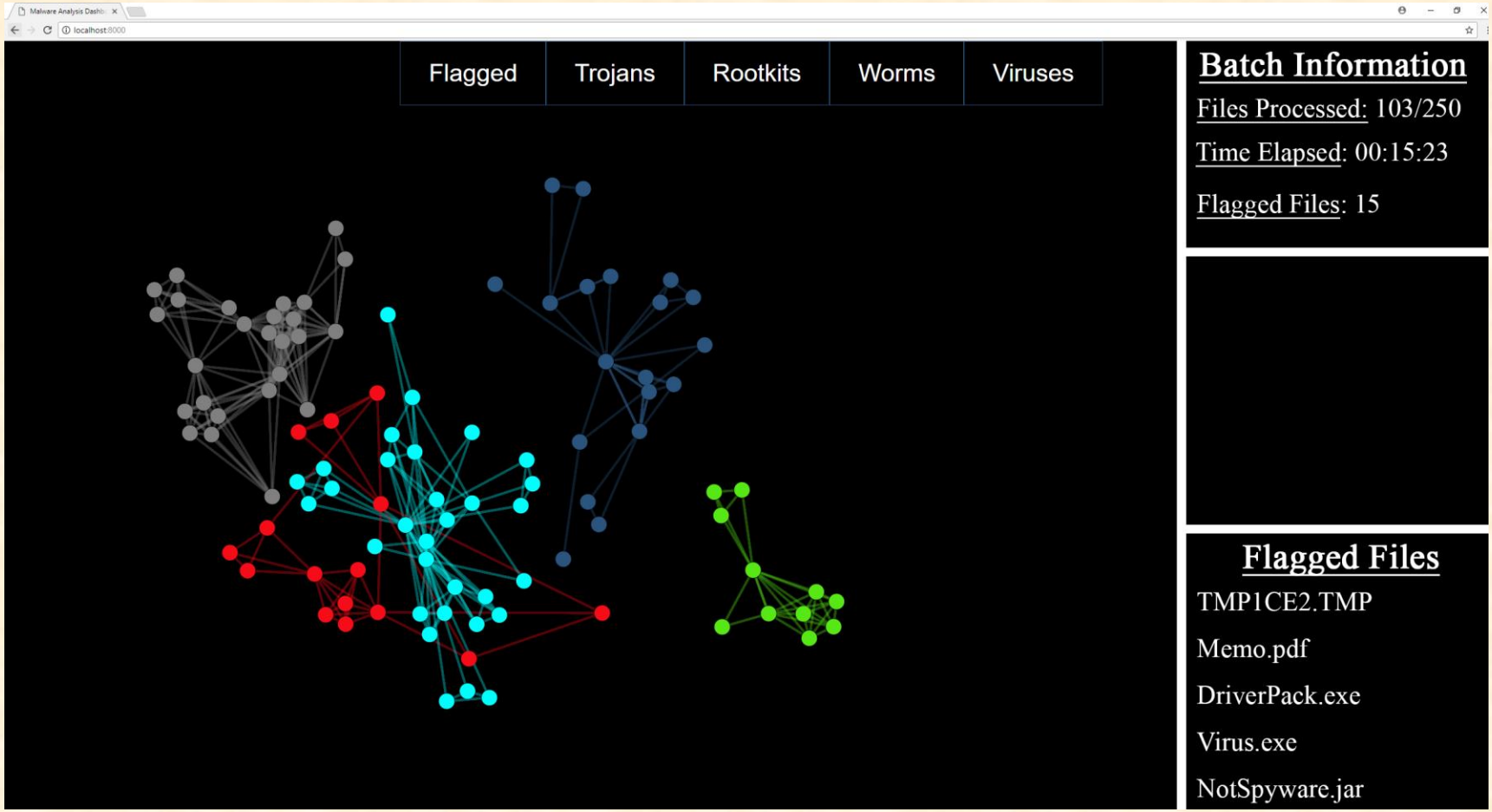
Functional Specifications

- Detect and cluster malware
- Provide a Web Dashboard for analysts
- Provide a framework for assigning signatures to new malware

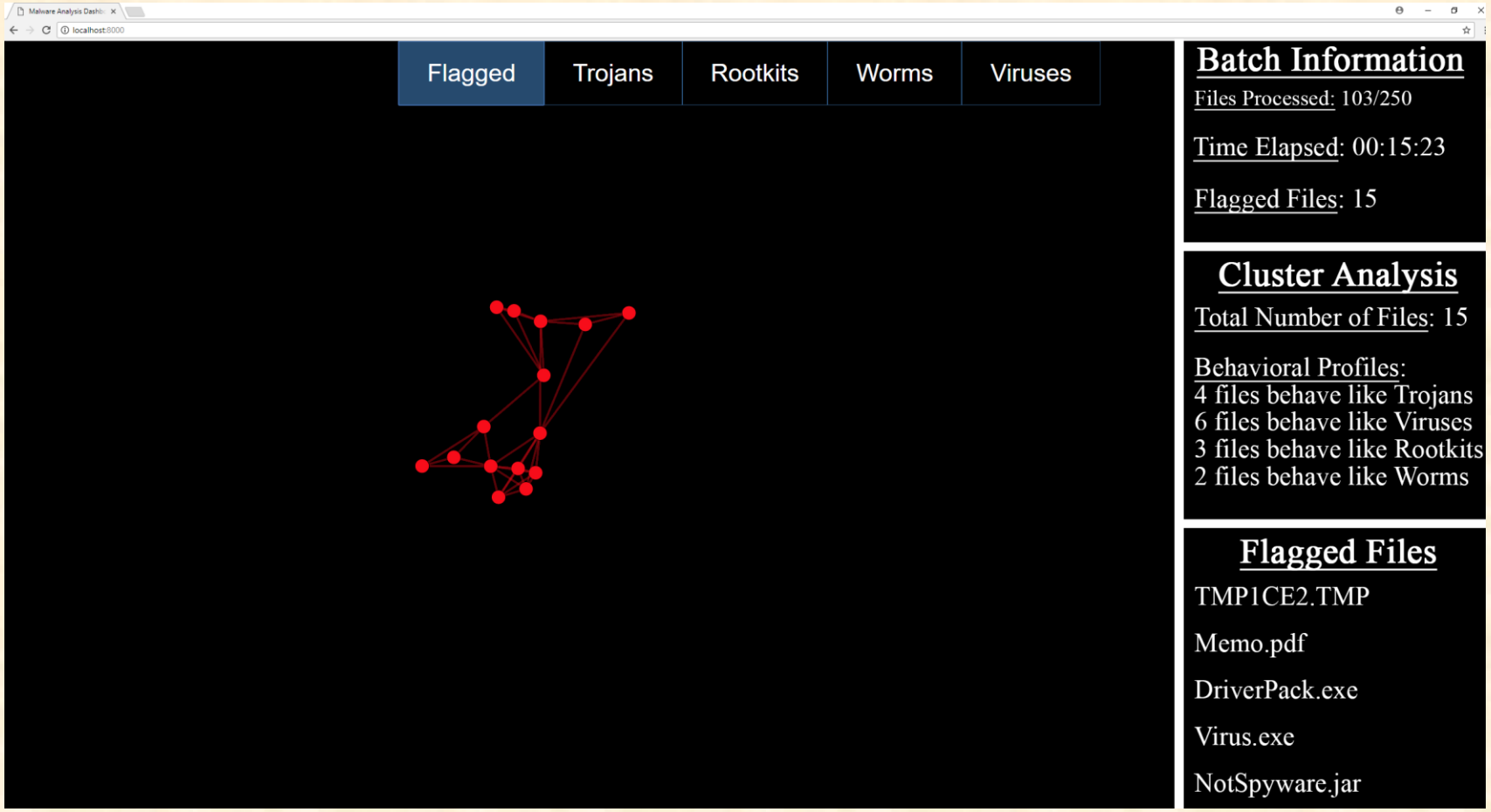
Design Specifications

- Malware analysis tool
- Malware aggregator
- Nodal graph display
- Malware statistics applets

Screen Mockup: Nodal Graph



Screen Mockup: Flagged Filtering

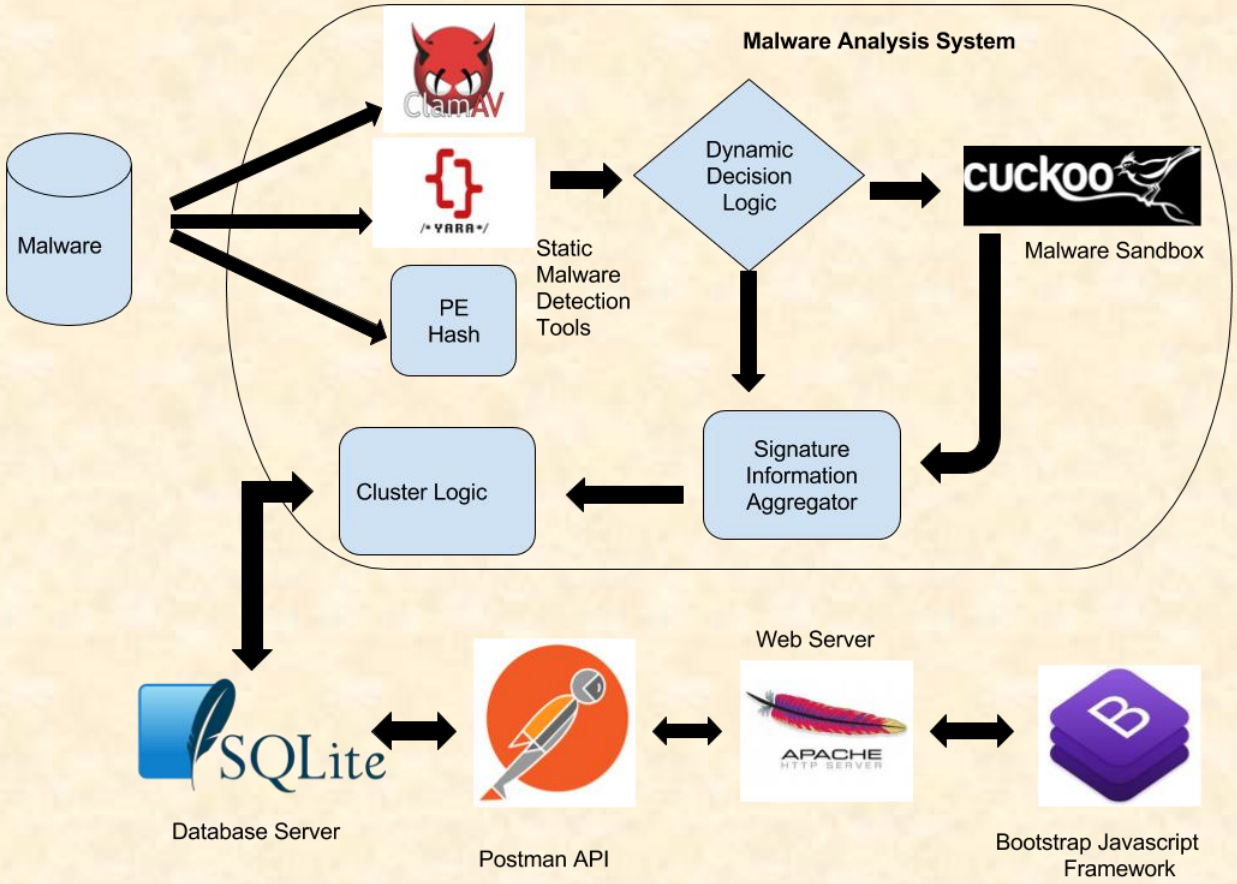


Screen Mockup: File analysis

Technical Specifications

- Static analysis module
- Dynamic analysis decision logic
- Malware sandboxing
- Signature information framework
- Malware aggregator
- Database
- Web Front End

System Architecture



System Components

- Hardware Platforms
  - Proofpoint hardware cluster
  - ESXi HyperVisor
  - Linux Ubuntu VMs
- Software Platforms / Technologies
  - Python, Yara, Cuckoo, ClamAV
  - SQLite, Apache
  - Postman API and Bootstrap Library

Risks

- Malware Clustering and Categorization
  - Clustering malware based on file characteristics
  - Research the best way to cluster malware (PE Hash or Fuzzy hashing)
- Understanding Dynamic and Static Analysis Tools
  - The tools behave differently and output different formats
  - Running different malware samples and analyzing outputs
- Scalability and Speed
  - Analyzing variable amounts of malware in an efficient way
  - Properly allocate resources for
- Signature Generation Framework
  - Provide a way for analysts to easily create the signature of a malware
  - Determine what analysis information is relevant for a signature

Questions?