MICHIGAN STATE UNIVERSITY

Project Plan
Profiling Manufacturing Plant Computer Network Traffic
The Capstone Experience
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Functional Specifications

- Manufacturing plant networks are targets
- Large amounts of traffic
- Machine learning
- Dashboard
Design Specifications

• Machine learning
  ▪ Search for anomalies
  ▪ Continuous learning

• Dashboard
  ▪ Web accessible
  ▪ Highlight network anomalies
Screen Mockup: Dashboard
Screen Mockup: Visualize
Screen Mockup: Machine Learning
Technical Specifications

• Front end of application built using ELK stack application suite.
  ▪ Elasticsearch (search), Logstash (data storage), and Kibana (graphs & visuals)

• Hosted locally, would be implemented in GM production server environment.

• Machine learning model built using X-pack
  ▪ Elastic Stack extension
  ▪ Analyzes preprocessed datasets provided by GM
System Architecture

GM Plant + Network Monitoring Tool

Netflow Log Server

Online Dashboard

elastic + logstash

x-pack

GM Network Security Team
System Components

• Hardware Platforms
  ▪ iMac Desktop Computers

• Software Platforms / Technologies
  ▪ ELK Stack
  ▪ X-pack Extension
  ▪ CSV files
Risks

• Scalability of Product
  ▪ Intake and process data in close to real time
  ▪ Enable processing of real time data, time-efficient analysis

• Representative Data for Machine Learning Model
  ▪ Organized and suggestive data input to model
  ▪ Filter data feed before model processes it

• Machine Learning Model Access
  ▪ Project is longer than what academic free trial can provide
  ▪ Create open free trial, transfer progress when possible

• Data Visualization
  ▪ Determine how to portray results effectively in dashboard
  ▪ Provide frequent communication, mock-ups to receive feedback
Questions?