Measuring Success in Self-Guided Information Assurance Training

David Tileston
Software Engineering Institute

Additional Authors:
Kimo Bumanglag, Adam Welle & Brandon Wolfe
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David Tileston
Kimo Bumanglag
Adam Welle
Brandon Wolfe
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This material is based upon work funded and supported by the Department of Defense under Contract No. FA8702-15-D-0002 with Carnegie Mellon University for the operation of the Software Engineering Institute, a federally funded research and development center.

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Agenda

- Introduction
- Problem Background
- Capturing High-Fidelity Data
- Tracking Interactive Training
- Future Use Cases
- Questions
Who Are We?

Carnegie Mellon University
Software Engineering Institute

Federally Funded Research and Development Center (FFRDC)
Problem Background

• High demand for “cyber operators”
• Extremely rigorous, lengthy training
• High standards
• High attrition rates
• High cost
• Basics matter!
A Need for Data

- Military flight trainings tracks loads of data about students
- Easier to evaluate student performance
- Ability to identify what works and what doesn’t
- Match training results to future performance

- Capturing course progression with xAPI
- Quiz results
- Length to complete labs
- Command input
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Metric Workflow

- Moodle
- Elasticsearch + Kibana
- Visualizations
- Learning Metrics
  - Quiz results
  - Answered Questions
  - Course Progression
- Commands issued
- Logstash
- Script
- Student VM

Learning Guides

- CentOS
- Elasticsearch
- Logstash
- Beats
- Kibana

- Learning Guides
- Script
- Logstash
- Commands issued
- Visualizations
- Learning Metrics
Virtual Programming Labs

1. Student develops script or program on virtual machine
2. Enters code in Moodle
3. Script or program executed in student virtual lab
4. Results evaluated in Moodle
5. Results sent to Elasticsearch

Moodle

Student VM

Elasticsearch + Kibana
Future Work

- Interactive videos
  - In-video quizzing
  - xAPI statements

- Automatic grading and course progression

- Measure progress of past students

- Analyze captured data
Try It Out

• https://cyberforce.site

• CAC-enabled

• Search “MCCORC”
Thank you!