Taking Splunk inside the Classroom

Automated Grading with Splunk

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Who Am I?

- Adjunct Professor at the University of Connecticut (http://business.uconn.edu)
- Splunk & Security Consultant for Hurricane Labs (https://hurricanelabs.com/)
- Master’s Degree in Business Analytics and Project Management from the University of Connecticut (http://msbapm.business.uconn.edu/)
- Splunk Certified Consultant II/Splunk Certified Sales Engineer III (https://www.splunk.com)
Why Am I Here?

- Solved a unique business problem in my role as a professor
- Share some experience I’ve had with Big Data inside the classroom
- Give you new ways to think about using Splunk
- Give you some strategies that might aid you in implementing business and security initiatives
Business Problem

- Teach students about Big Data using emerging technologies
- Leverage Big Data Applications to provide valuable course content
- Ensure I taught the course in an efficient manner
Questions I wanted to answer

- When did a student start the project?
- When was a student having technical trouble with the project?
- How long did it take for a student to complete the project?
- Do I need to modify or increase resources on these VM’s?
- What can I do to improve the project next year?
Why Is This Problem Significant?

- For better or for worse, education in 2017 is a business problem.
- Students are paying significant amounts of money for their education - they are going to want to get the most out of it.
- For students to get more out of their courses, we need to spend less time with technology “overhead” and more time teaching.
- In fast emerging fields like Big Data, departments that can teach concepts effectively and efficiently are more likely to be successful.
The course that I am focusing on here is “Network Design and Applications”

Previously taught by another professor

The content was great, however it was dated - the syllabus was last updated 2 years prior to me teaching the class

Professor left the University with no knowledge transfer
The “Network Design and Applications” course required a project simply titled the “Password Project”

Setbacks included:

- Undocumented project parameters
- “Institutional Knowledge”
- Fast approaching deadline

Important! - This course was closely being watched by department heads
Let’s Start With Documentation

How was this project created?

- SQL Query to get list of students
- Generate Virtual Machine Names based on Student List
- Create Folder for each user
- Apply Required Permissions
- Deploy Virtual Machines from Template
- Customize Hostnames

Really great process by the IT Department at the UConn School of Business (HUGE Thank you to Christopher Zissis, Christopher Buckridge, and Chris Hewitt at UConn. Also to Rob Reed at Splunk for guidance on the course)

Process generated 2 VM’s per student, totaling 72 VM’s plus an additional File Server.

72 VM’s were running with limited visibility into what was going on
How Can I Solve This Problem?

- Splunk!
- Splunk offers real-time analytics
- With schema-on-the-fly, Splunk can parse data quickly
- Splunk can store data for as long as I want
Inserting Splunk Into the Picture

SQL Query to get list of students

Generate Virtual Machine Names based on Student List

Create Folder for each user

Apply Required Permissions

Deploy Virtual Machines from Template

Customize Hostnames

I was able to add Splunk into a VM Template by using the following instructions:

http://docs.splunk.com/Documentation/Forwarder/latest/Forwarder/Makeuniversalforwarderpartofahostimage

This simple process allowed me to install a forwarder on all 72 of the student VM’s

Once that forwarder was installed, I could manage it using a Deployment Server to collect any data I needed
Documentation With Splunk

Splunk Infrastructure:
- 2 Ubuntu Servers

Student Systems:
- 36 Windows
- 36 Ubuntu
- 1 File Server
Collecting Data
How Did I Answer My Questions?

By collecting the following data from these machines I could begin to answer questions:

- Performance Data
- Security Logs
- Application Logs (ophcrack, windows process monitoring)
- User-generated data - custom file formats
Creating a project that worked

- With Splunk in place, I was able to create a project that I felt made sense.

- I was able to run through cracking a windows password a number of times and see what kind of logs were generated in Splunk.

- With that data, I developed a project that not only taught students something, but could be parameterized and quantified with data.
## Automated Grading

### Password Project Overall Report

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</tbody>
</table>
CPU Usage and other Performance Metrics can tell us if students are utilizing VM's
Questions I was able to answer

- When did a student start the project?
- When was a student having technical trouble with the project?
- How long did it take for a student to complete the project?
- Do I need to modify or increase resources on these VM’s?
- What can I do to improve the project next year?
Example: Answering Questions

Date student claims they started project: October 1st

Date student actually started the project: October 13th

Project Due Date: October 14th
Thank You

Any Questions?