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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)



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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





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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?

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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

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Network Design and Applications

- 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

Example - "Password Project"

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

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



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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	Generate Virtual Machine Names based on Student	Create Folder for	11.2		Customize Hostnames
students	List	each user	Permissions	Template	

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

http://docs.splunk.com/Documentation/Forwarder/latest/Forwarder/Makeauniversalforwarderpartofahostimag e

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

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Collecting Data



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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



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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

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Building Dashboards

Password Project Stud This panel will track the progress of each s NetID rwo06001	dent Status student during the Password Project Time Period Last 30 days	Edit V More Info V
Ubuntu IP Address Set?	Windows IP Address Set?	User Account Creation Status NetID Added to Administrator Group
yes	yes	yes yes
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		2 RW006001- rwo06001 \\3222-FILESERVER\Network-Tools\Rainbow-Tables\vista_special W7-2
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Automated Grading

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Monitor Performance Data

CPU Usage and other Performance Metrics can tell us if students are utilizing VM's

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Questions I was able to answer

- When did a student start the project?
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Example: Answering Questions



Thank You

Any Questions?

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