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Sierra-Cedar's Best Practices for Building a Security Operations Center

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About Me

- Sierra-Cedar, Inc.
  - One of the largest independent North American IT services companies
  - Provider of full scale PeopleSoft hosting services with over 50 hosted clients
  - Currently support over 600 PeopleSoft environments and over 17,000 concurrent PeopleSoft users
- My Role
  - Support security and compliance activities for both US and overseas operations
  - Manage five person team located in US, Canada, and India
  - Splunk Certified Architect, Computer Forensics Analyst, Computer Programmer, Incident Response Manager, etc.

Agenda

- What problem are we trying to solve?
- Using Splunk App for Enterprise Security (ES) to detect malicious activity
- Using Splunk App for Stream for targeted analysis of external threats
- Detecting malicious activity using the integration of Splunk Apps for Stream and Enterprise Security
- Takeaways

What Problem Are We Trying to Solve?

Scenario

The Splunk App for Enterprise Security triggers an alert that traffic on your network is communicating with an IP address from one of your threat intelligence feeds.

- What is this traffic?
- Did our firewalls block this traffic?
- Do we have any tools capturing the traffic to give us more information?
- How many of these alerts are we getting and can our team keep up?

Before Splunk App for Stream

- We have enabled several free threat intelligence feeds in the Splunk App for Enterprise Security
- We have created several notable events that trigger when a threat IP is identified
- The security team researches these events to identify what traffic is being received/sent
  - Currently a manual process that involves several searches, dashboards, etc.
  - Could lead to conducting computer forensics
- Security team may coordinate with the network team to setup packet captures in hopes of capturing session details

After Splunk App for Stream

- Security team has additional insight into network traffic that was not previously able to be captured
- Selective data capture uses our Splunk license more efficiently
- Correlation with other security relevant data helps with quick incident resolution
  - Fast incident resolution ➡ less damage during a breach ➡ less financial impact to the business

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Using ES to Detect Malicious Activity

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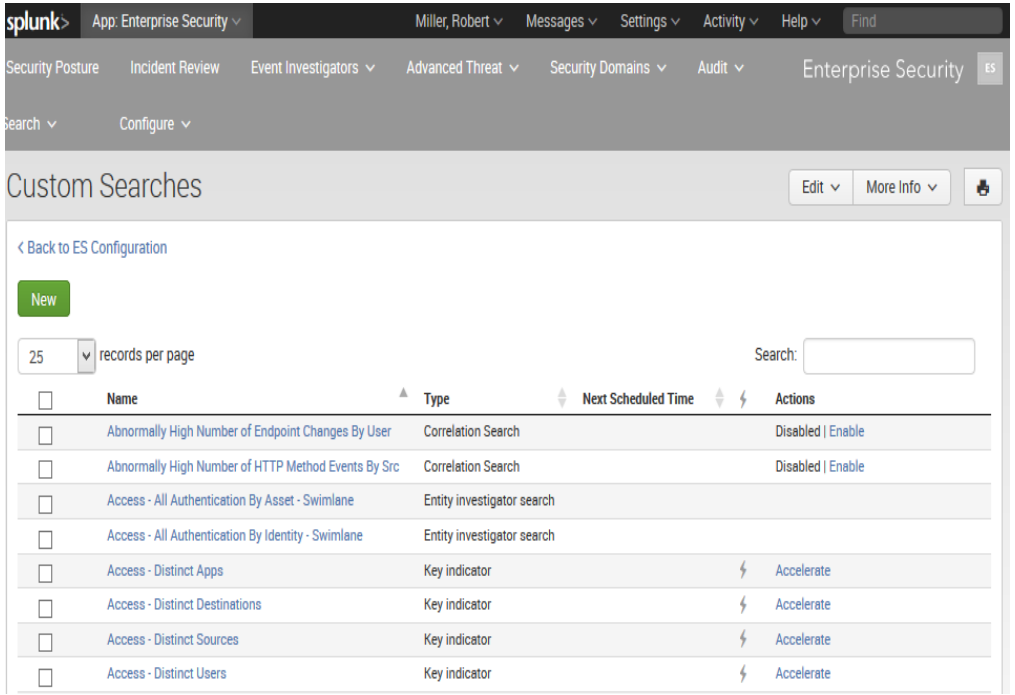
Correlation Searches- Critical to Detect Threats

- There are almost 200 pre-built notable events
- Not all pre-built notable events will be relevant for your environment
  - Turn on searches one at a time and determine relevance



To Detect External Threats

Account access, account activity, login attempts and activity searches were used

- Access – Local Account Created
- Access – Local Admin Account Created
- Activity from Expired User Identity
- Anomalous Audit Trail Activity Detected
- Brute Force Access Behavior Detected
- Cleartext Password At Rest Detected
- Default Account Activity Detected
- Default Account At Rest Detected
- Excessive Failed Logins
- Geographically Improbable Access Detected
- Inactive Account Activity Detected
- New User Account Created on Multiple Hosts
- Short Lived Account Detected
- Threat Activity Detected – External – Stream Capture
- Threat Activity Detected – Internal – Stream Capture

Threat Activity- Correlation Searches

We created an inbound, outbound “Threat Activity Detected” search

splunk> App: Enterprise Security | Miller, Robert | Messages | Settings | Activity | Help | Find

Security Posture | Incident Review | Event Investigators | Advanced Threat | Security Domains | Audit | Enterprise Security ES

Search | Configure

Custom Searches

Edit | More Info

< Back to ES Configuration

New

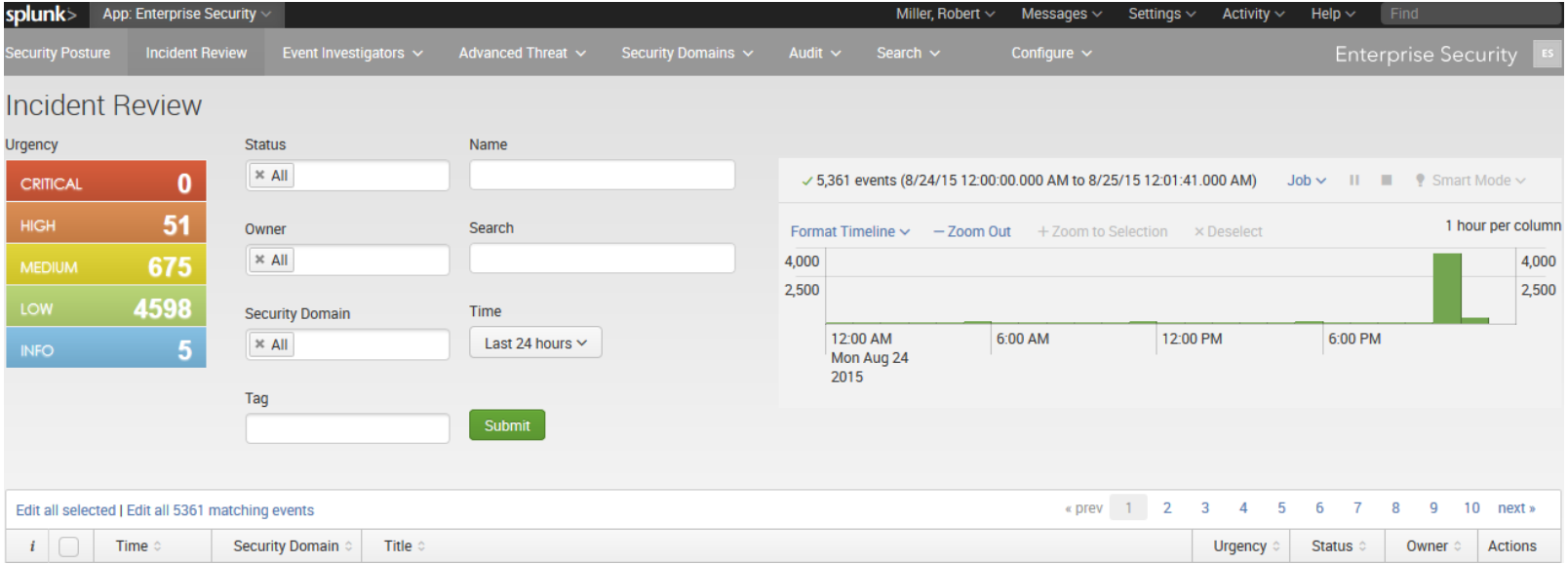
25 records per page

Search: threat activity detected

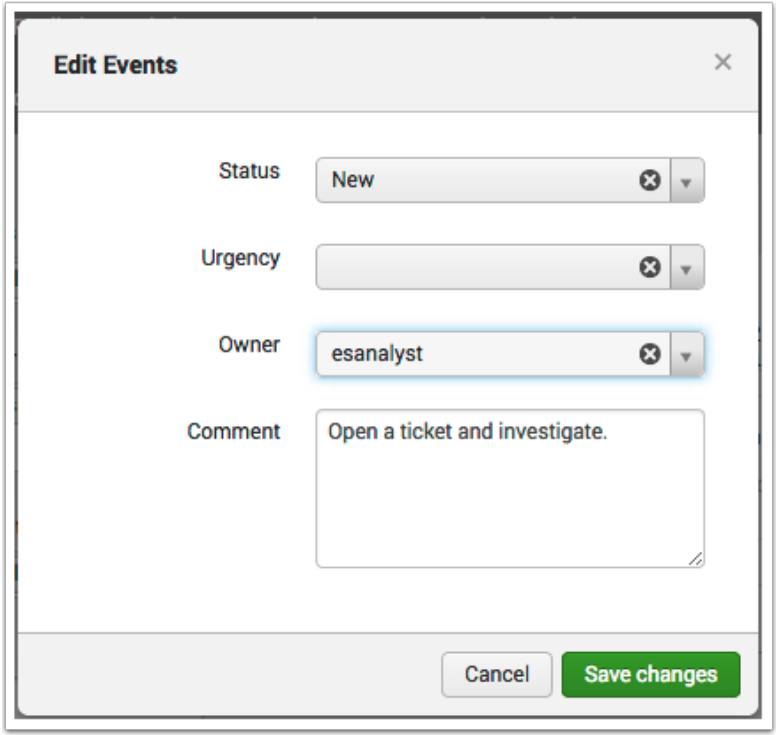
Name	Type	Next Scheduled Time	Actions
Threat Activity Detected	Correlation Search		Disabled | Enable | Change to real-time
Threat Activity Detected (SCI)	Correlation Search		Disabled | Enable | Change to real-time
Threat Activity Detected - External (SCI)	Correlation Search	2015-08-24 22:50:00 EDT	Enabled | Disable | Change to real-time
Threat Activity Detected - External - Stream Capture (SCI)	Correlation Search	2015-08-24 22:40:00 EDT	Enabled | Disable | Change to real-time
Threat Activity Detected - Internal (SCI)	Correlation Search	2015-08-24 22:50:00 EDT	Enabled | Disable | Change to real-time
Threat Activity Detected - Internal - Stream Capture (SCI)	Correlation Search	2015-08-21 16:30:00 EDT	Enabled | Disable | Change to real-time

Incident Review

- We used the incident review dashboard to track all notable events that are triggered



Incident Review– Case Assignments



- Example : Ability to assign an analyst to a notable event

Threat Intelligence Downloads

- We used the out of the box, free threat intelligence feeds
- In addition, you have the ability to add additional ones

Threat Intelligence Downloads

Data inputs » Threat Intelligence Downloads

New

Showing 1-48 of 48 items

Results per page 100

Name	Type	Description	URL	Weight	App	Status	Actions
AlienVault BOT	Bot	Bot network	http://reputation.alienvault.com /reputation.data	1	SplunkEnterpriseSecuritySuite	Enabled | Disable	Clone | Delete
AlienVault Phishing	Phishing	Phishing websites	http://reputation.alienvault.com /reputation.data	1	SplunkEnterpriseSecuritySuite	Enabled | Disable	Clone | Delete
AlienVault Spam	Spam	Spam websites	http://reputation.alienvault.com /reputation.data	1	SplunkEnterpriseSecuritySuite	Enabled | Disable	Clone | Delete

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Using Splunk App for Stream for Targeted Analysis of External Threats

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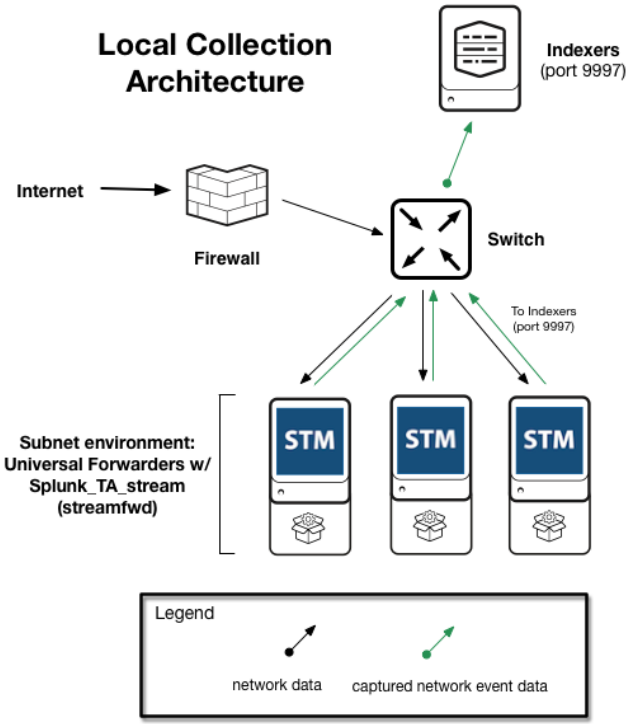
Our Benefits

- Ability to capture database traffic without making changes to the database
- All details of traffic are in JSON format and makes it easy to search
- Deployment is not complicated
- No longer have to engage another team to get packet captures
- Security and IT Operations use cases

Our Architecture

- We are using the local network collection architecture
- Deployed Splunk_TA_Stream to all universal forwarders using Deployment Server
- All universal forwarders need to access server running Splunk Apps for Stream and Enterprise Security



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Detecting Malicious Activity Using the Integration of Splunk Apps for Stream and Enterprise Security

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Configuration Checklist

- The Splunk App for Stream needs to be installed on same server as the Splunk App for Enterprise Security
  - Confirm hardware specs
- All universal forwarders need access to server running app
  - Possible firewall rule changes
- Identify notable events or create your own to use for stream capture

Configuration Step 1: Edit Correlation Search

Use case: threat activity detected

- Confirm the following fields are defined:
  - src
  - src_ip
  - dest
  - dest_ip

Edit Correlation Search

Edit | More Info

< Back to Custom Searches

Correlation Search

Search Name * Threat Activity Detected

Application Context SA-ThreatIntelligence

Description Alerts when any activity matching threat intelligen

Describes what kind of issues this search is intended to detect

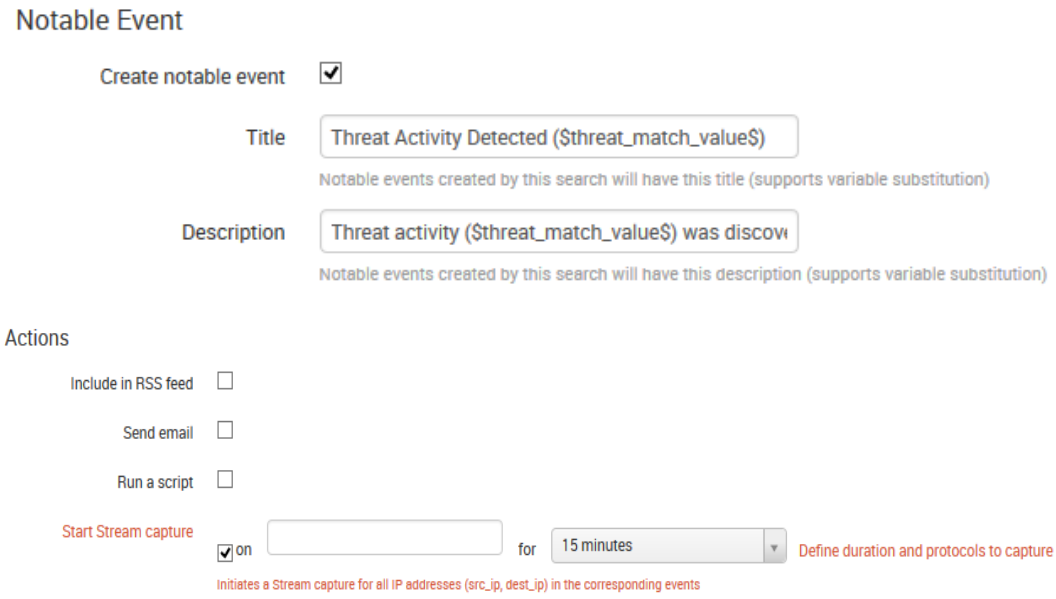
Search *

```
| datamodel Threat_Intelligence Threat_Activity search | `drop_dm_object_name("Threat_Activity")` | dedup
threat_match_field,threat_match_value | `get_event_id` | table _raw,event_id,source,src,dest,threat* |
`per_panel_filter("ppf_threat_activity","threat_match_field,threat_match_value")` | `makesv(src)` | `makesv(dest)` |
`get_threat_attribution(threat_key)` | rename source as orig_source,source_* as threat_source_*,description as threat_description |
`map_notable_fields` | fields - *time | eval risk_object_type=case(threat_match_field="query" OR threat_match_field=="src" OR
threat_match_field=="dest","system",threat_match_field=="src_user" OR threat_match_field=="user","user",1=1,"other") | eval
risk_object=threat_match_value | eval src_ip=src | eval dest_ip=dest
```

Configuration Step 2: Edit Correlation Search

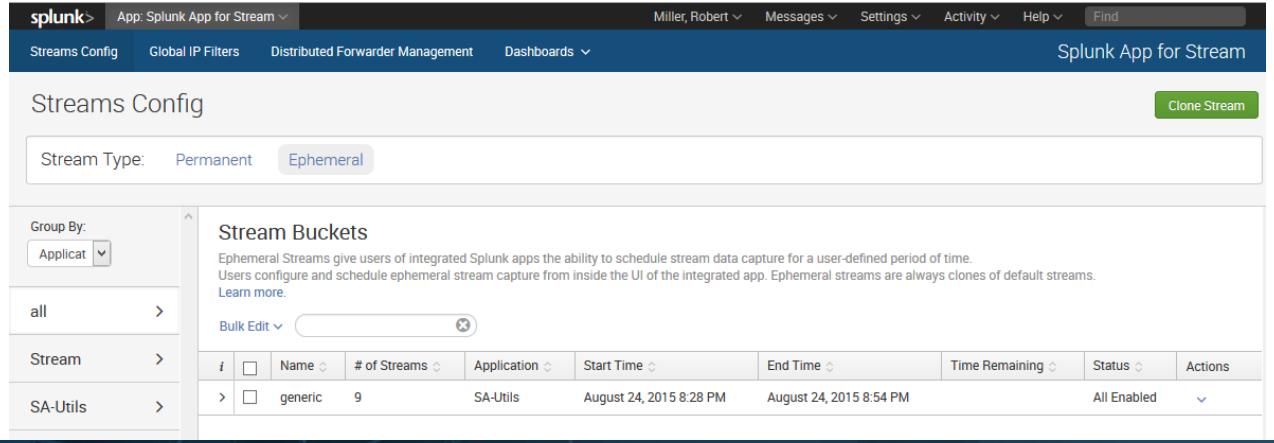
Use case: threat activity detected

- Confirm checkmark is next to "Create notable event"
- Scroll to "Actions" section
  - Place checkmark in "Start Stream capture"
    - Choose protocols to capture
    - Choose amount of time for capture



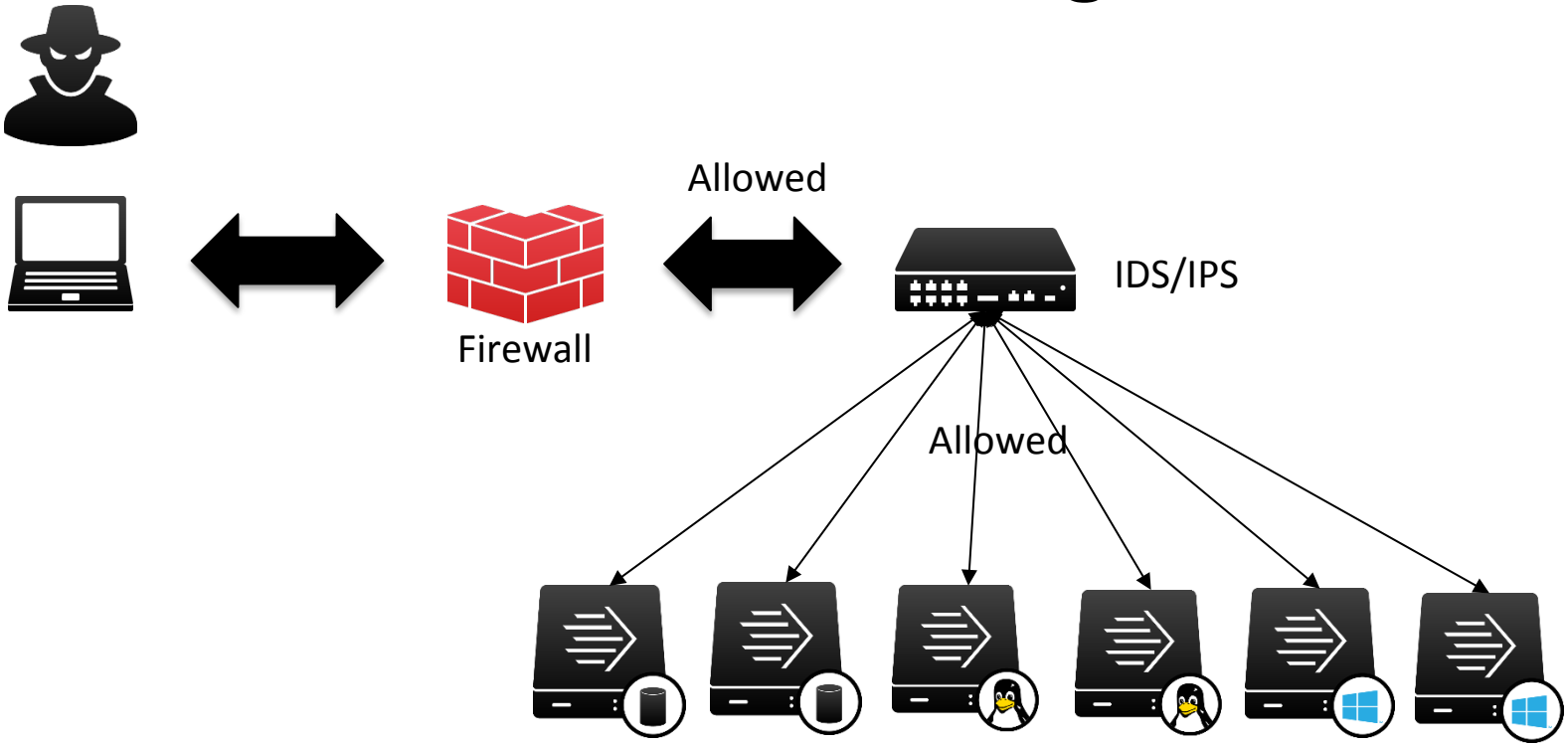
Configuration Step 3:Confirm Captures Are Working

- On Incident Review dashboard, once new event shows up navigate to the Splunk App for Stream
- Click on the Ephemeral link
  - All current streams will show up on this page
  - Option to kill any streams that are listed

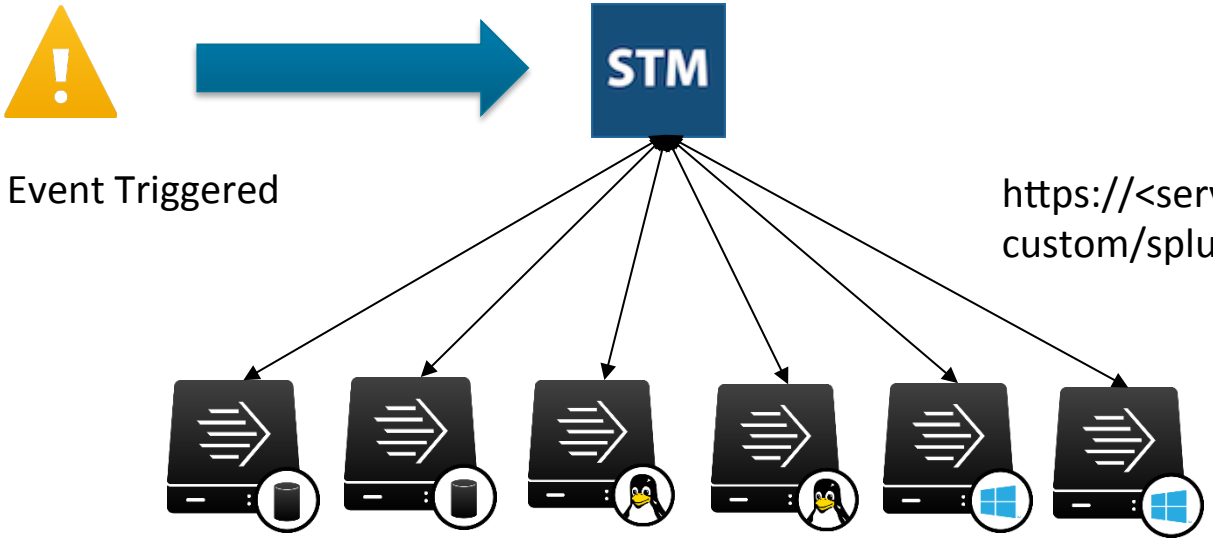


How Does It Work?

Attacker Accessing Network



ES Notable Event Triggers Stream Capture



Notable Event Triggered

https://<server>:<port>/en-us/custom/splunk_app_stream/

Takeaways

Why We Love It?

- Additional visibility into network traffic
- Selective data capture limits license usage
- Targeted analysis of external threats with selective data capture
- Doesn't require a change control process to a server/ network appliance
- No longer need to use 3rd party tools to read packet captures
- Additional logs in a centralized location to help with intrusion detection

Recap of Takeaways

- Make sure all your logs are CIM compliant
- Depending on your environment, choose the correct collection architecture
- When first starting off, disable all streams in the “defaultgroup”
- All universal forwarders need to access server running Splunk App for Enterprise Security and Splunk App for Stream

What's Next for Us?

- Add Splunk App for Stream collection to additional correlation searches
- Look at possibly having Splunk App for Stream running 24/7 for certain protocols and/or groups of servers
- Extend the capture time from 15 minutes to a longer interval

Questions?

THANK YOU