Splunk, OSINT And Visualization Catching Bad Guys With Pictures

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.conf2016

splunk>

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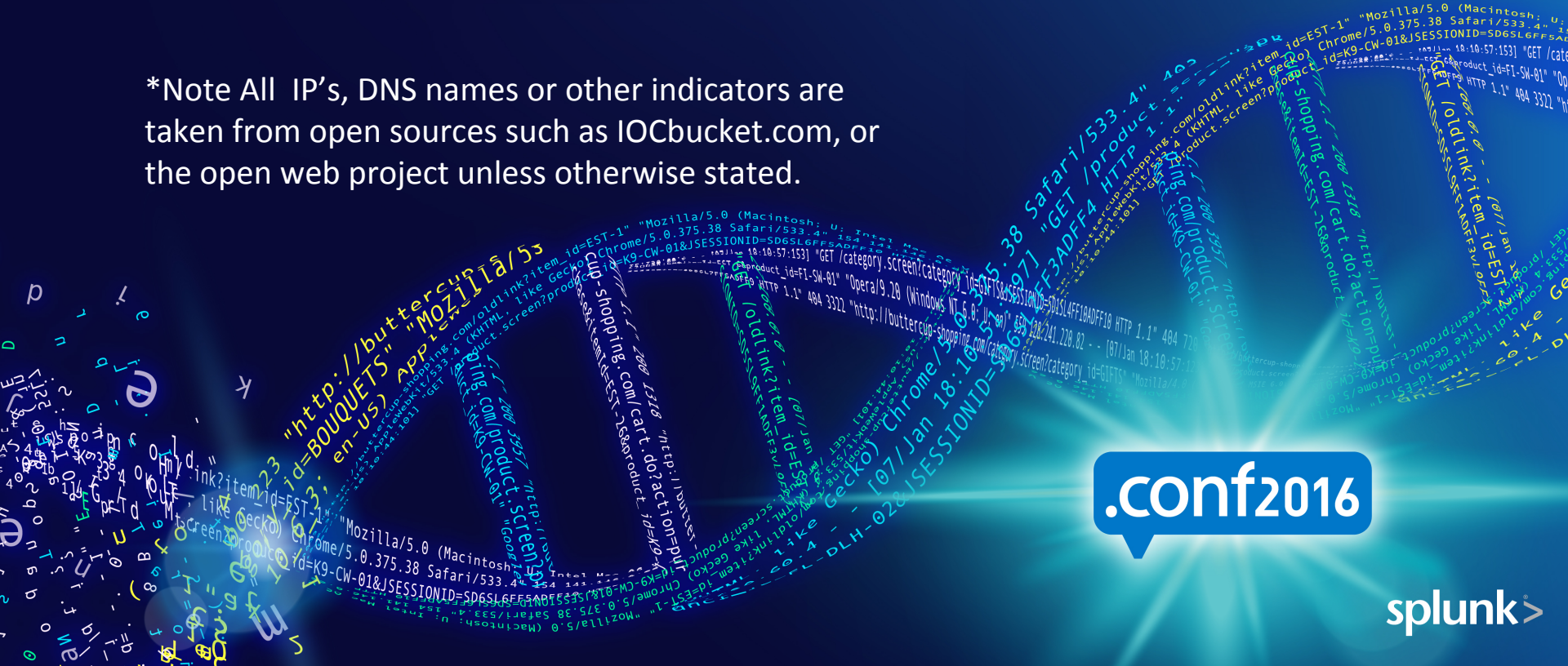
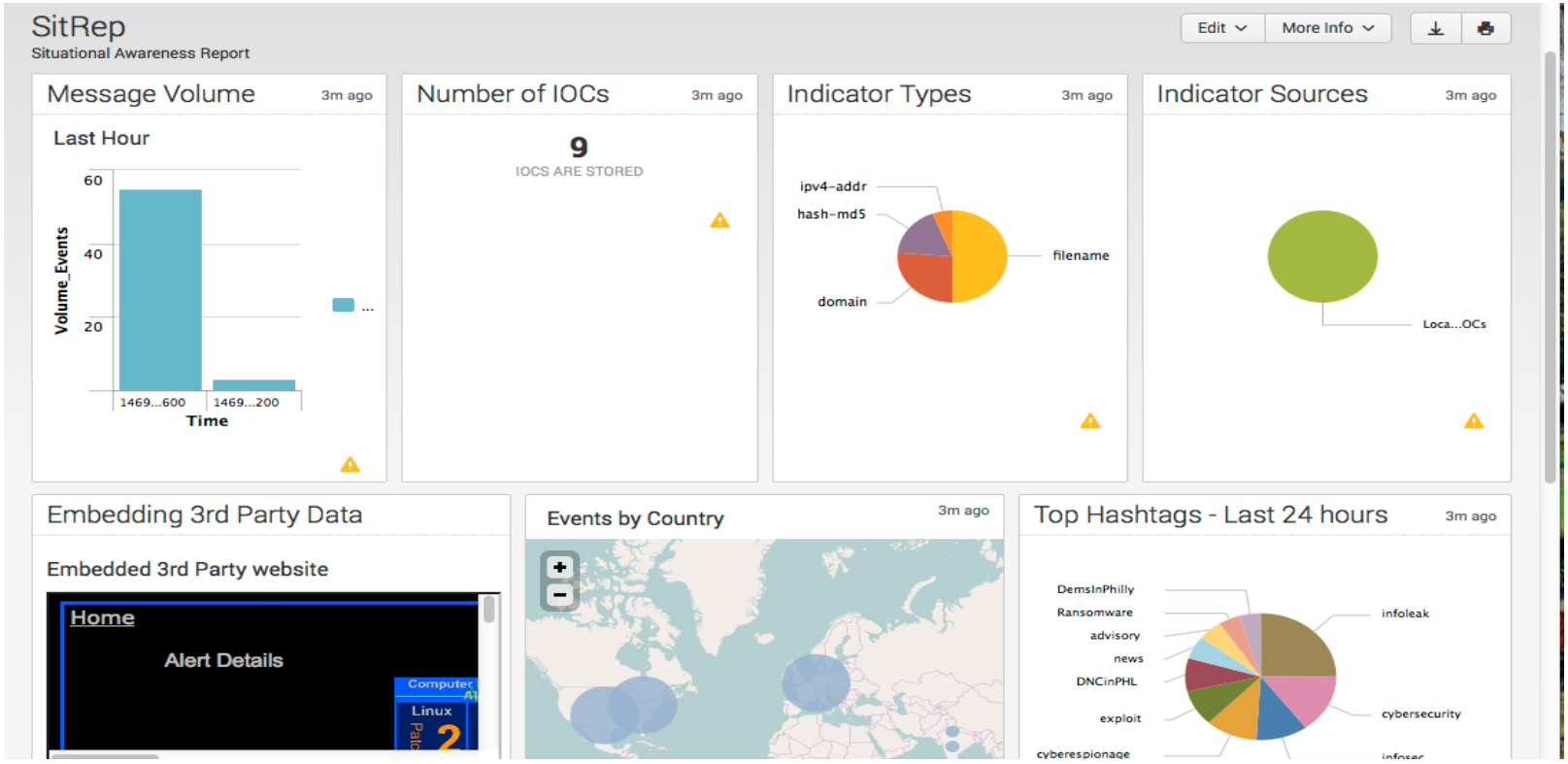
Jumping Right In – An Example

*Note All IP's, DNS names or other indicators are taken from open sources such as IOCbucket.com, or the open web project unless otherwise stated.



Situational Awareness Dashboard

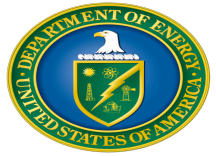


Agenda

- Introduction
- A Picture Speaks A Thousand Words
- What Is OSINT?
  - How Can Splunk Use This
- Visualization
- Hunting Bad Guys
- Conclusions

Speaker Background

- Currently
  - Director of Threat Intelligence, The Crypsis Group
- Prior
  - Practice Director – Incident Response and Forensics McAfee/Intel Security (Americas)
  - Incident Response Auditor for DoD CIO CND-SP/ CCRI team
  - Lead Analyst The White House Security Operation Center (EOP)
  - Founded The White House Cyber Threat Cell
  - Over 15 year career spanning a variety of customers in US Military, Intelligence Community, and Federal Law Enforcement

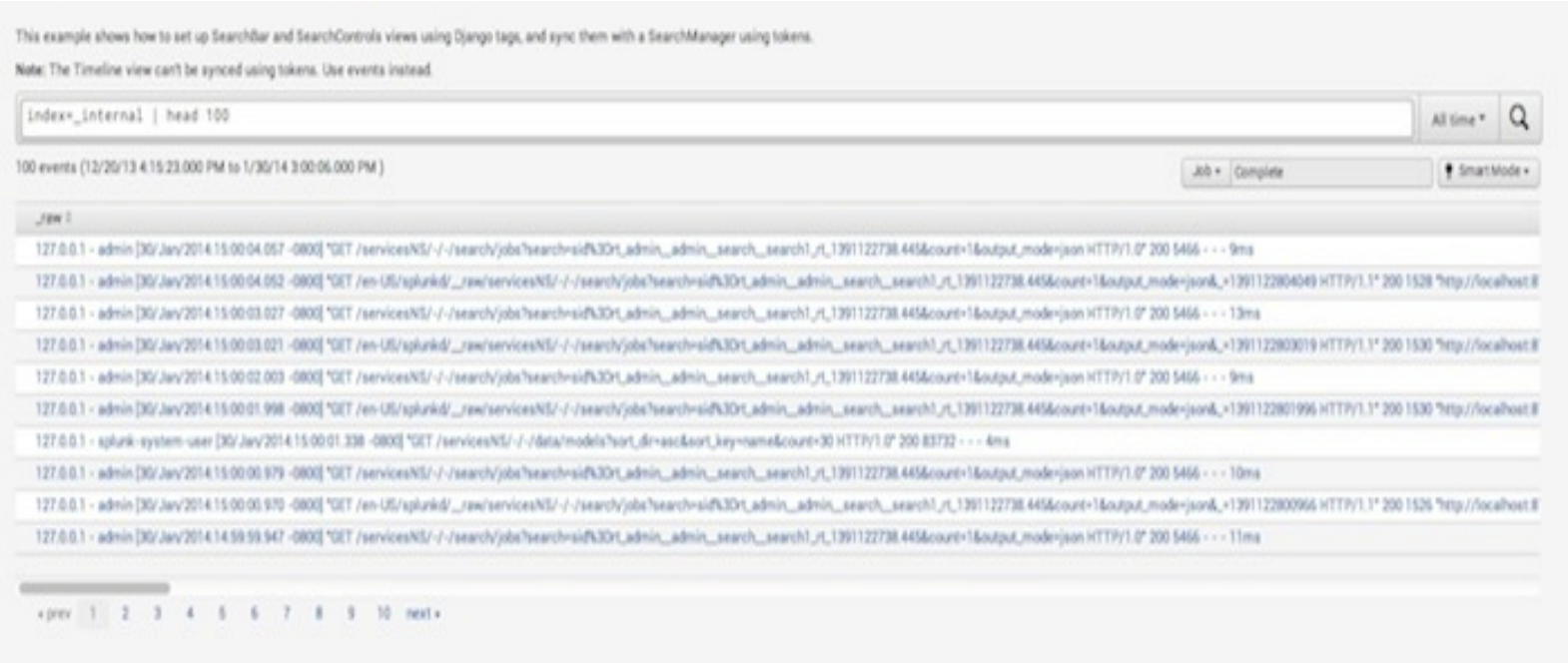



Why Does Imagery And Visualization Matter?

Machine Data
Not Really Helpful To Most Humans

Splunk
Raw Data

Machine readable, Searchable, difficult to highlight and identify patterns

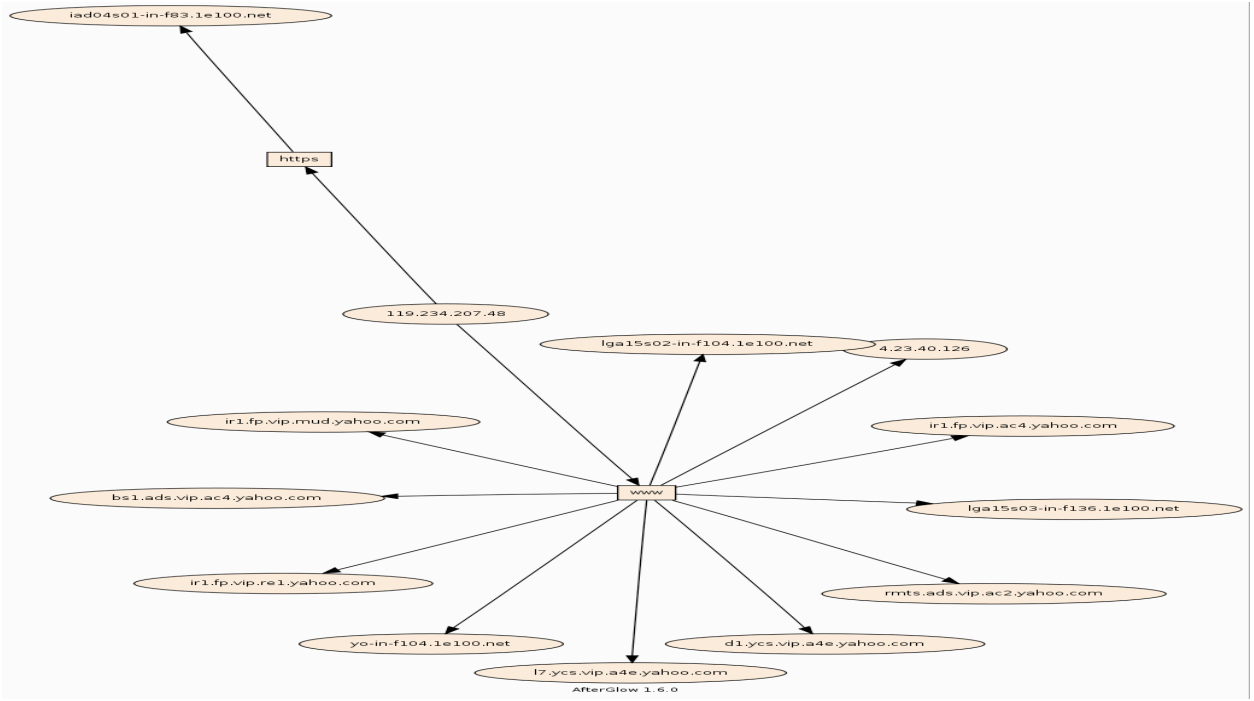


Visualization/Imagery
Very Easy For Humans To Understand

Images are much more powerful

As humans we process colors, shapes, and connections
These are much easier to spot patterns, odd or unknown items and convey critical information.

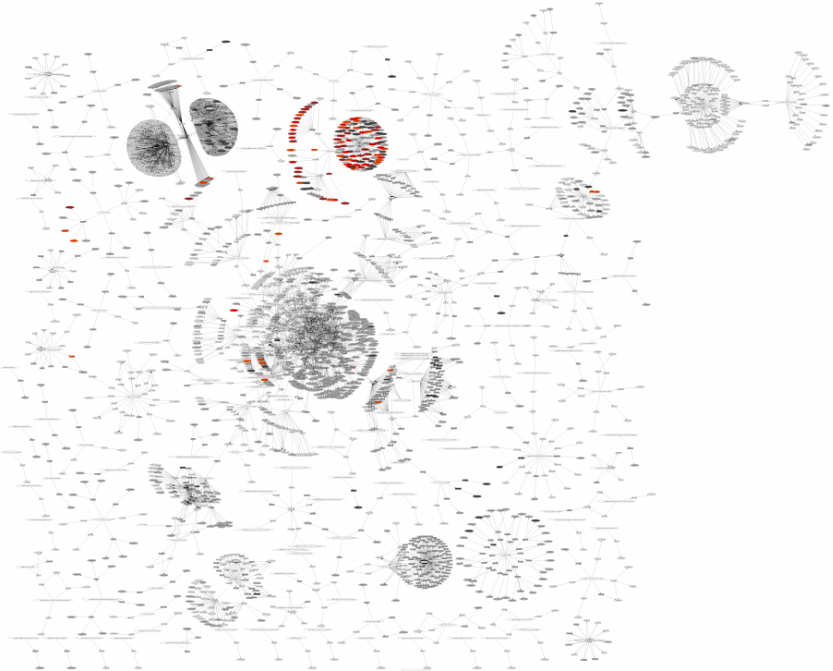
On the Right: Outgoing HTTP connections from a single IP



Examples Of Visualization

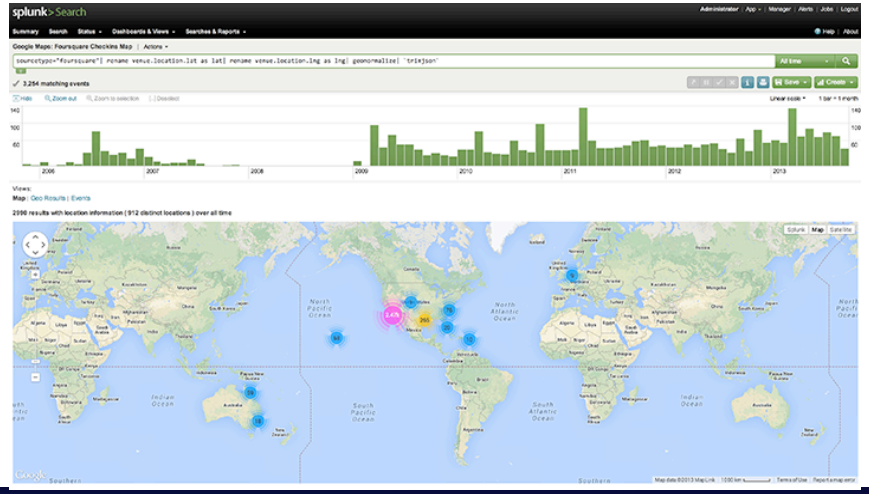
Link Analysis

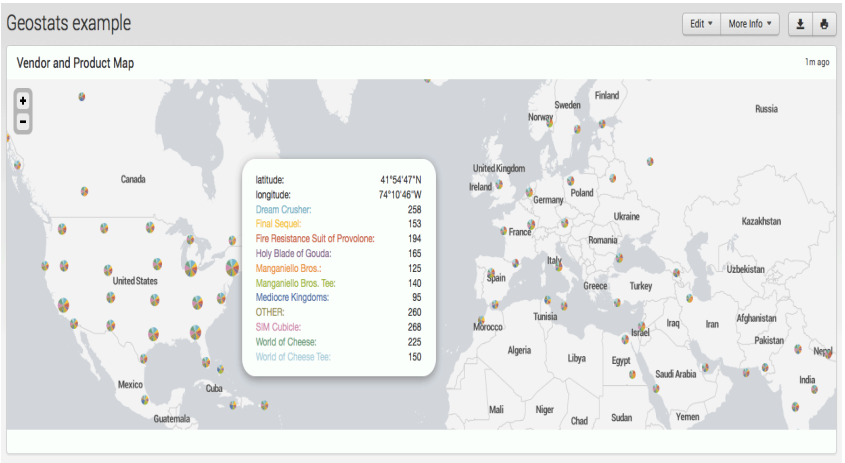
- Splunk App - Afterglow
- From a search outputs/ visualizes ‘tuples’ of information
- In this case this is NIDS events – Signature, Source Addres, Destination Address, Count
- Shows Blooms around specific Signatures



Heat Maps, iplocation And Geostats

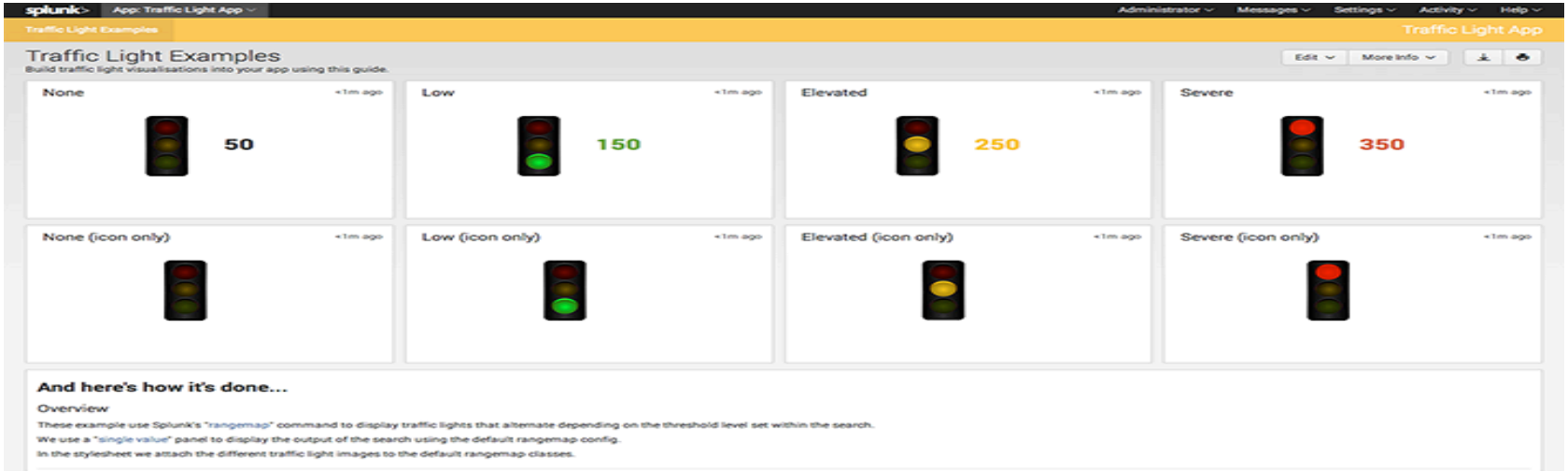
- Splunk embedded commands – iplocation and geostats
- On the Left is an Example Dashboard with Google Maps bloom icons for hits
- On the Right is another Map using geostats and OpenStreetView





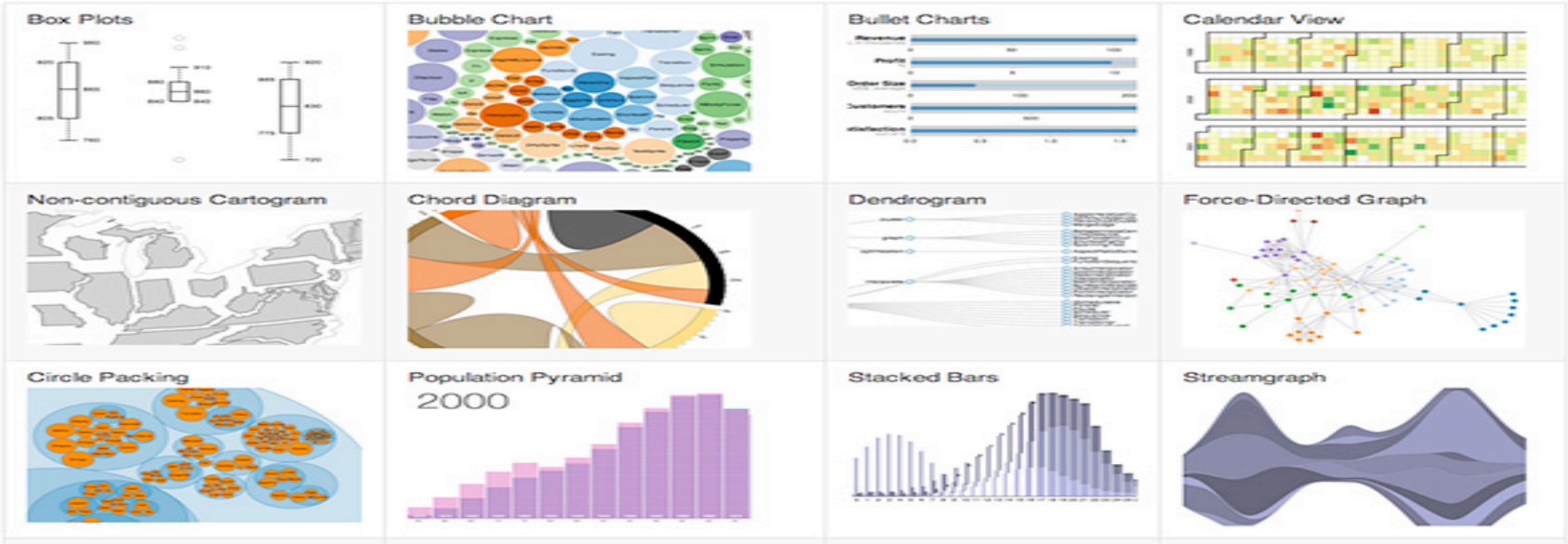
Traffic Light/Visual Acuity Clues

- Splunk App – TLP – Traffic Light Protocol
- Splunk icons and CSS stylesheets, that communicate overall information

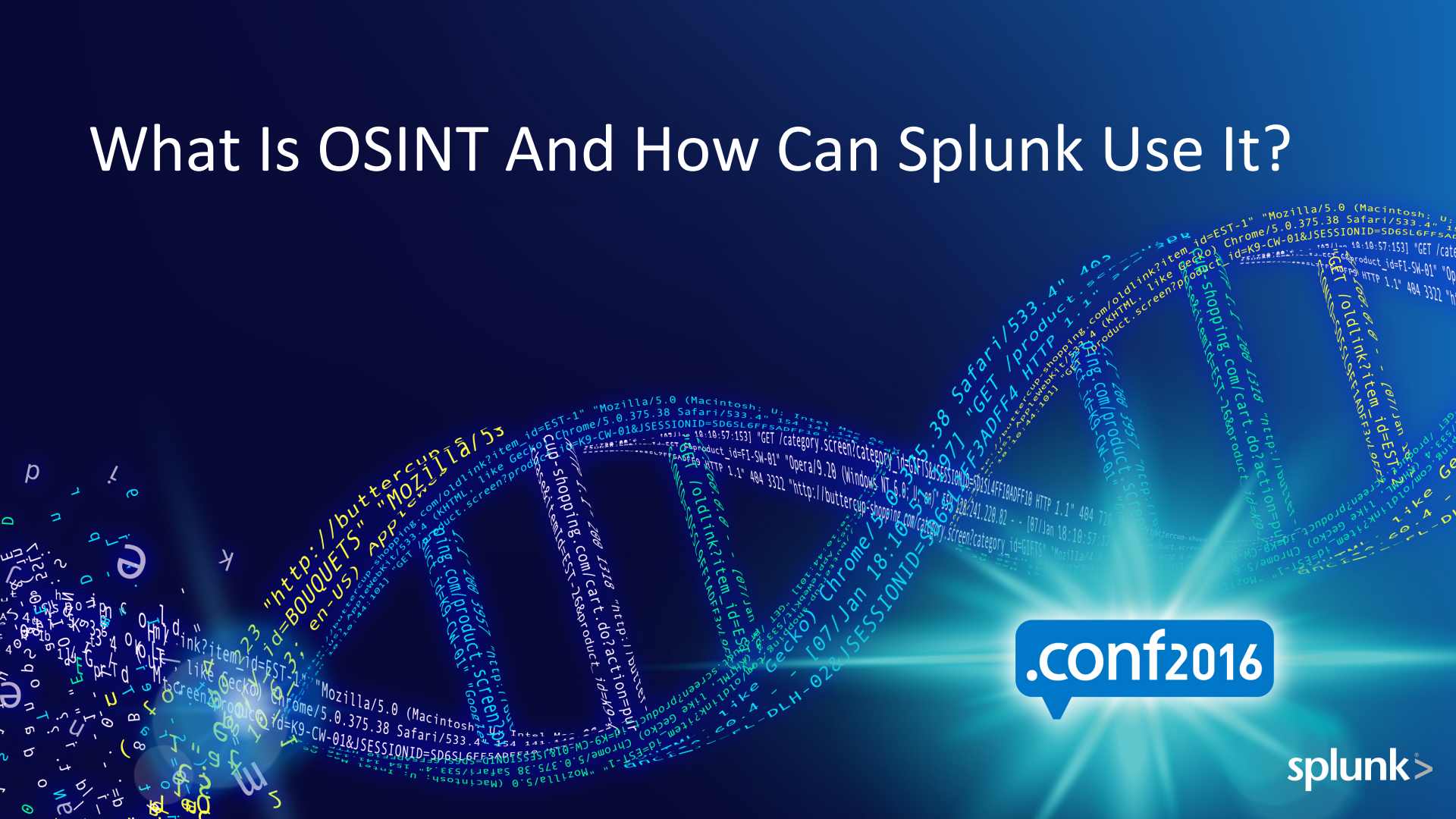


D3 And The Splunk Web Framework

- Splunk extension/App – The Web Framework
- Leverages Advanced Splunk capabilities for visualization like D3



What Is OSINT And How Can Splunk Use It?



Open-Source INTelligence = **OSINT**

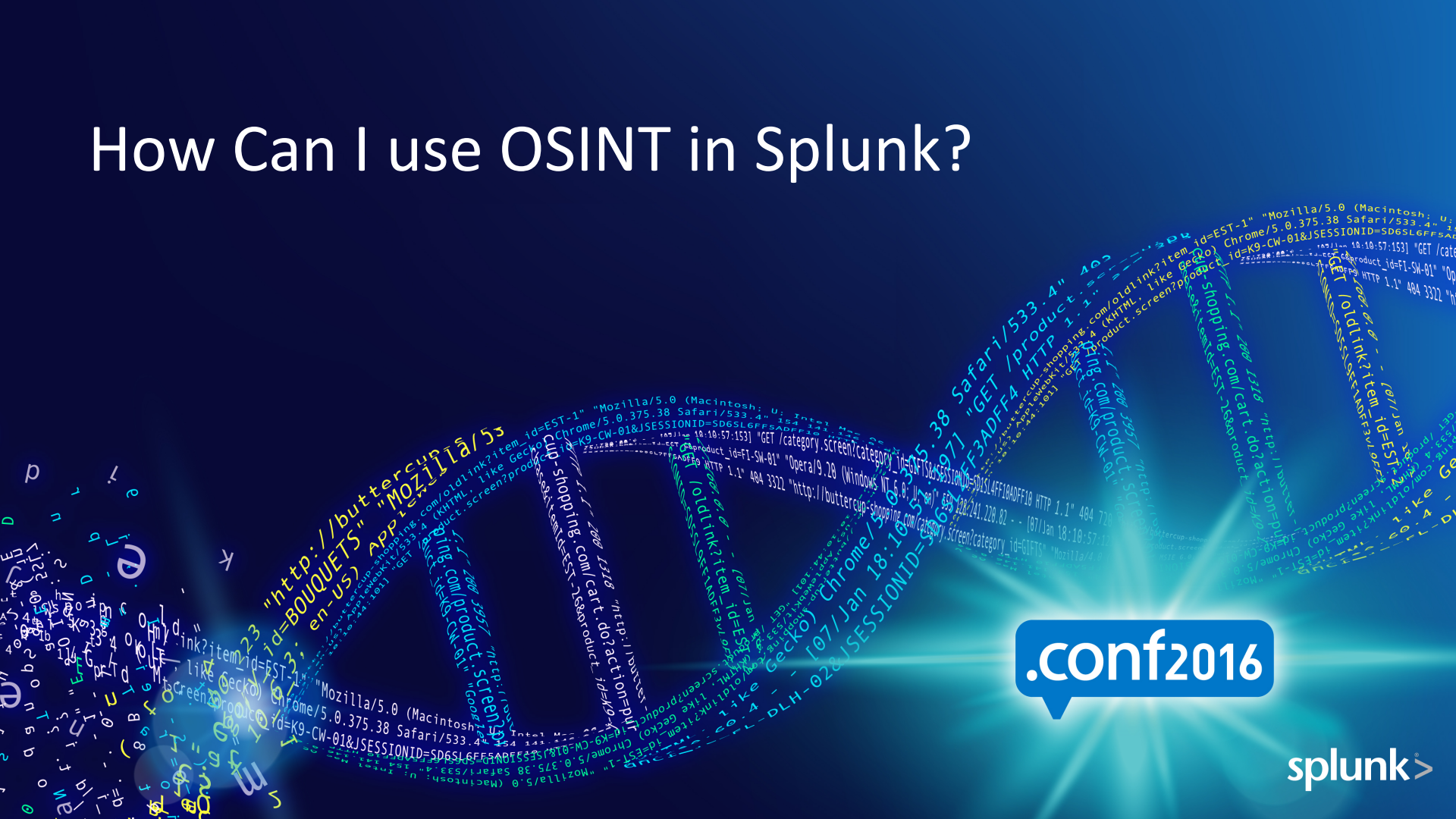
- **Open-Source Intelligence** (OSINT) refers to a broad array of information and sources that are generally available, including information obtained from the media (newspapers, radio, television, etc.), professional and academic records (papers, conferences, professional associations, etc.), and public data (government reports, demographics, hearings, speeches, etc.).
- Unlike the other INTs, open-source intelligence is not the responsibility of any one agency, but instead is collected by the entire USIC. One advantage of OSINT is its accessibility, although the sheer amount of available information can make it difficult to know what is of value. Determining the data's source and its reliability can also be complicated. OSINT data therefore still requires review and analysis to be of use to policymakers.

Source: http://www.fbi.gov/about-us/intelligence/disciplines

Why Do I Care About OSINT?

- Data Enrichment
  - Adding Context to events and searches
- Visual Acuity
  - Security Operations Centers
    - Warnings and Alerts
    - World Threat view/Big Screen Display (Funding Assistance Device)
    - Status System Overview
- Early Warnings and Alerts
  - Real-time alerting for sensitive (timeframe, political, etc) events.
  - Forward looking predictive search highlights – Sporting Events, etc

How Can I use OSINT in Splunk?



Embedded Splunk functionality

Lookups

Lookups add fields from an external source to your events based on the values of fields that are already present in those events.

A simple lookup example – Adding HTTP comments to HTTP status codes

"200" = "OK"

"404" = "Not Found"

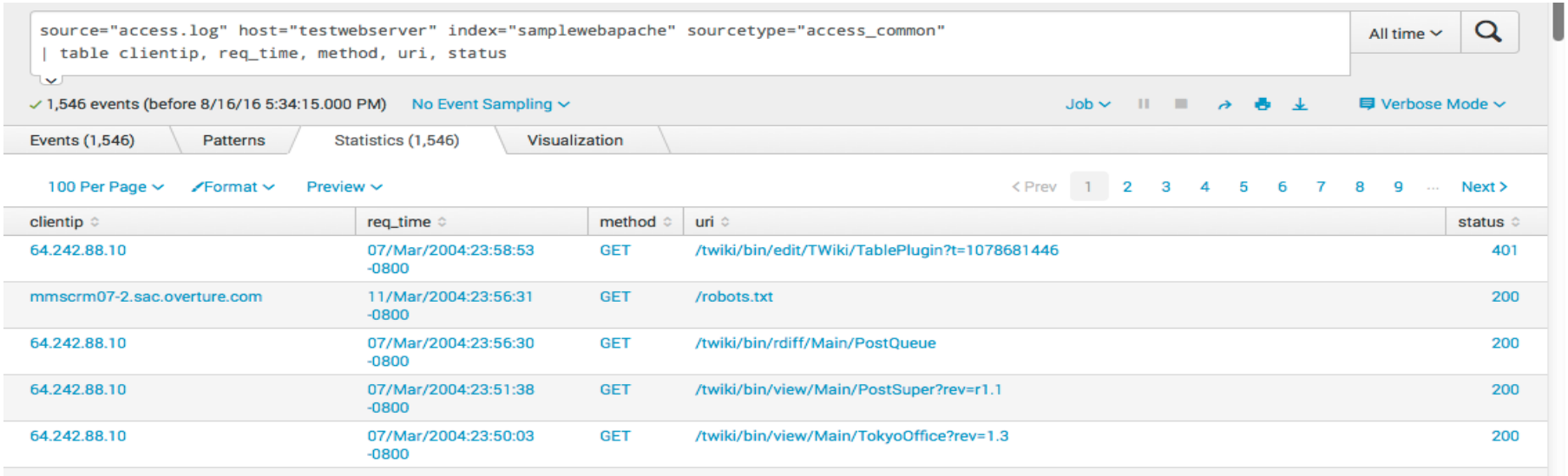
Multiple Types of Lookups – Reference below

Types of Splunk Lookups		
CSV lookup	A common separated file	Useful for static data
External	3rd party such as a DNS server lookup	Useful for dynamic data
KV Store	KV Collection Store	Useful for KV tables of data
Geo-Spatial	KMZ file that is geographic boundary file	Useful for grouping events into places on earth

Lets Add Some Context To That Data

- Normal output from Apache web logs.
  - Note the only the HTTP Code is present

"200", "401", etc



Lookup Definitions – Give That Data Context

- Splunk Community created a CSV file for HTTP Status messages.
  - http://wiki.splunk.com/Http_status.csv

  Fields:
  Status, status_description, status_type

- Create a Lookup File and Definition
- Call Lookup and provide Output column

  Mysearch | Lookup HttpSstatusLookup status AS status OUTPUT status_description AS Description

```
source="access.log" host="testwebserver" index="samplewebapache" sourcetype="access_common" | dedup status
| table clientip, req_time, method, uri, status
| lookup HttpStatusLookup status AS status OUTPUT status_description AS Description
```

All time

✓ 6 events (before 8/16/16 5:42:28.000 PM) No Event Sampling Job Verbose Mode

Events (6) Patterns Statistics (6) Visualization

100 Per Page Format Preview

clientip	req_time	method	uri	status	Description
64.242.88.10	07/Mar/2004:23:58:53 -0800	GET	/twiki/bin/edit/TWiki/TablePlugin?t=1078681446	401	Unauthorized
mmscrm07-2.sac.overture.com	11/Mar/2004:23:56:31 -0800	GET	/robots.txt	200	OK
h24-70-56-49.ca.shawcable.net	07/Mar/2004:21:16:17 -0800	GET	/twiki/view/Main/WebHome	404	Not Found
cpe-203-51-137-224.vic.bigpond.net.au	09/Mar/2004:18:01:24 -0800	GET	/mailman	302	Found
10.0.0.153	11/Mar/2004:15:52:37 -0800	GET	/dccstats/index.html	304	Not Modified
h194n2fls308o1033.telia.com	09/Mar/2004:13:49:05 -0800	-		408	Request Timeout

Embedded Splunk functionality - Search Commands/ Search Scripts

Allow for scripts to be used as Lookups

IP Lookups for Tor Records

Search for an IP address to see if it's part of the Tor Network.
Invoked By
CLI:

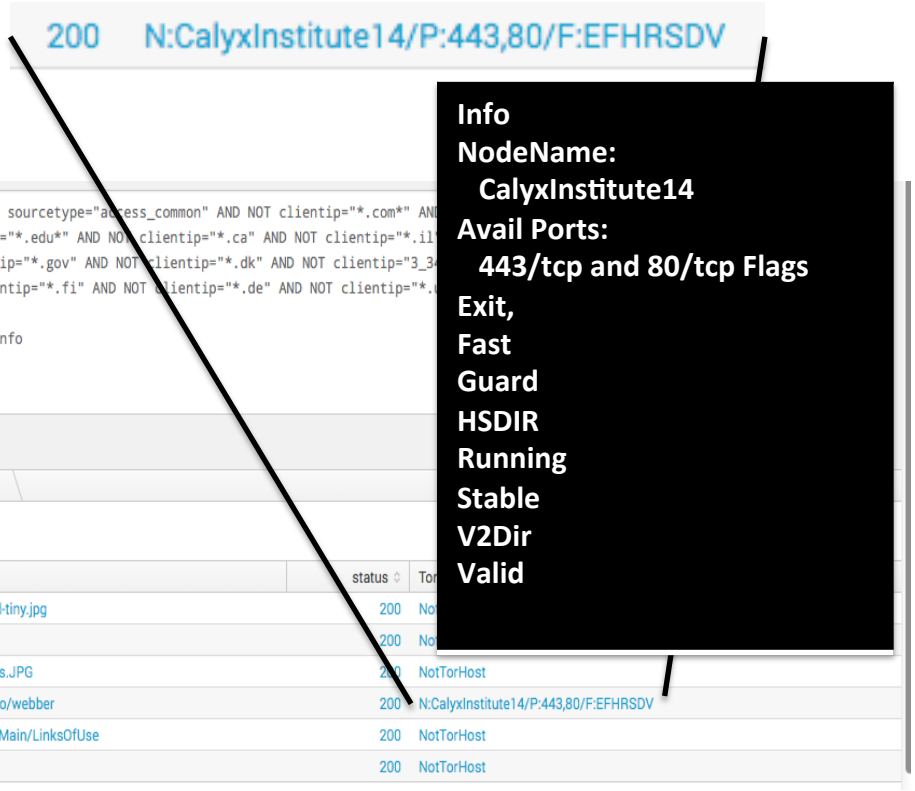
python ip_blacklist_tor.py <IP_address>

Splunk:

index=security_logs sourcetype=nids |
lookup torLookup ip AS clientip OUTPUT torinfo AS TorInfo
| table sourcetype. clientip, TorInfo

Positive Hit (CLI)
IP=162.247.72.201 **Nodename=CalyxInstitute14 PORTS=443,80 FLAGS=Exit,Fast,Guard,HSDIR,Running,Stable,V2Dir,Valid**

Negative Hit (CLI)
IP=199.231.120.81.tor.dan.me.uk **Nodename=NOT_TOR PORTS=NOT_TOR FLAGS=NOT_TOR**



Embedded Splunk functionality - Search Commands/ Search Scripts

Allow for scripts to be used as Lookups

Enhanced DNS Lookup

- Start with the default dnslookup script
  - Ships with Splunk
- Prototype (not ready for production)
- DNS Lookup for IP resolution then extended
  - For multiple DNS servers
  - Google DNS, OpenDNS, and AlterNet

DNS lookup Multiple DNS servers

CLI:

python external_lookups.py <IP_address>

Splunk:

index=security_logs sourcetype=nids | lookup EnhancedDNS clientip OUTPUT AltDNSResults| table _time, clientip, AltDNSResults

Example CLI Output (Prototype -- Need to limit for Splunk)

Method #1 - Socket Lookup

Socket lookup static.75.118.4.46.clients.your-server.de

Method #2 - DNSPython Lookup

DNS Reverse 75.118.4.46.in-addr.arpa.

Method #3 - DNS resolver Lookup - Google Pub DNS

DNS Resolution Name1 NO DNS RESPONSE

Method #3 - DNS resolver Lookup – OpenDNS

DNS Resolution Name NO DNS RESPONSE

Geospatial Lookups

- New feature in Splunk 6.3 – Choropleth's

A thematic map with areas shaded in proportion to the measurement of a variable

Visualizes how a measurement varies by geographic region

You can add your own

KMZ – Compressed KML file format

Top – Splunk provided

Bottom – App Shapester Demo

Splunk Apps – A Rich Landscape

Splunk Apps

Generally offer extensive user interfaces that enable you to work with your data, and they often make use of one or more add-ons to ingest different types of data.

Some Examples of Apps

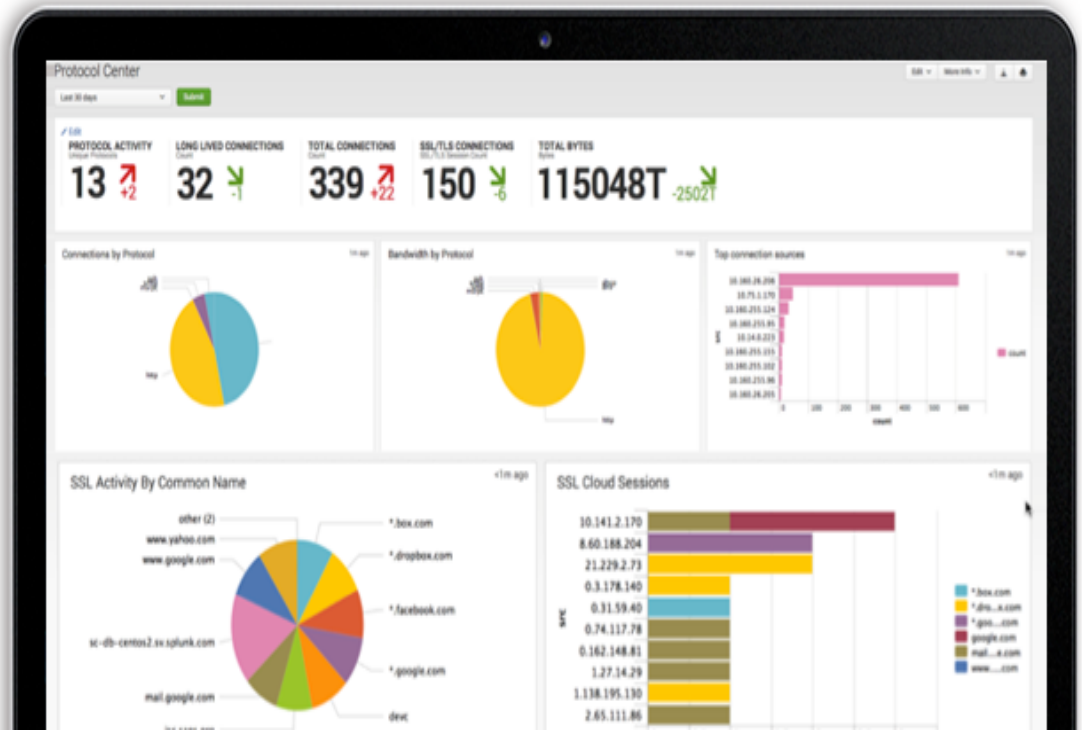
- **Splunk ES (Enterprise Security) – (263)**
  - Splunk Enterprise Security gives teams the insight to quickly detect and respond to internal and external attacks, to simplify threat management while minimizing risk. ES helps teams gain organization-wide visibility and security intelligence for continuous monitoring, incident response, SOC operations, and providing executives a window into business risk.
- **Splice – (now SA-Splice – 2637)**
  - SPLICE currently supports STIX 1.1, CybOX 2.1, OpenIOC 1.0 and 1.1 formats and provides a way of consuming IOCs in Splunk to leverage the indicators and provide greater context than common threat feeds. SPLICE can monitor local directories, or mount points, for incoming IOCs as well as TAXII feeds like Soltra Edge to periodically poll IOCs.
- **Shapester –(2893)**
  - This app lets you draw your own shapes and polygons directly on the map and save them as a geospatial lookup. You can then use this lookup to set up alerts based on geofences. Or you can create a building map by drawing the buildings of your campus.
- **Here Maps (Paid) – (1887)**
  - The here maps app brings a couple of nice added map visualization options: marker maps, cluster maps, heat maps, line maps and choropleth maps. All of them can be customized. It also adds a reverse geocoder for translating lat/lng combinations into human readable addresses.

Splunk ES –Enterprise Security

Paid app from Splunk

Features

- CIM compliant data access (standardized splunk data)
- Out-of-the-box alerting, reporting, and dashboards
- Incident and Event Management options

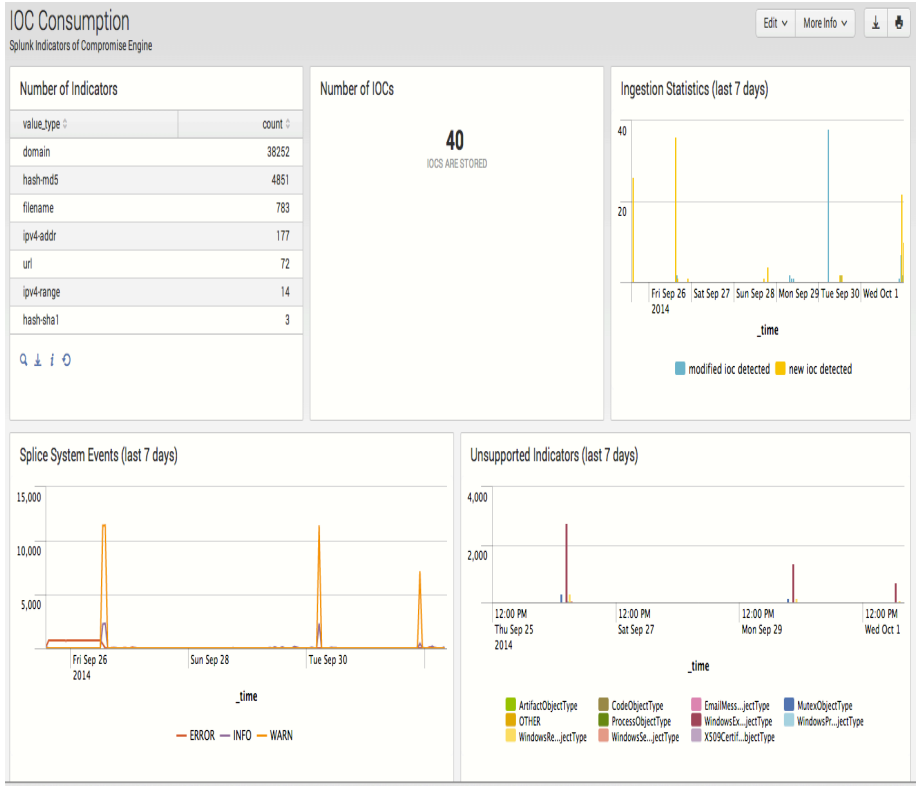


Splice – Indicator focused, ES-like

Free app from Splunk

Features

- Data enrichment
  - Support indicators in multiple formats
  - STIX, CyBox, OpenIOC, Yara
- Out of the box rules, dashboards, and lookup tables for threat information

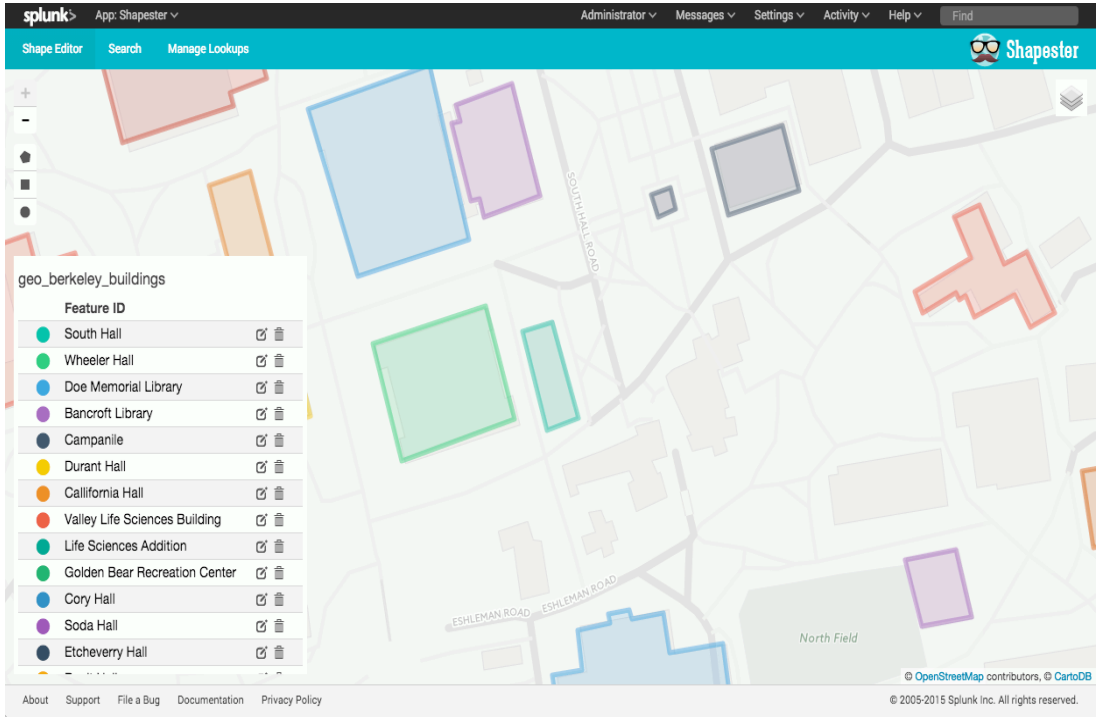


Shapester – Geo-fencing The World

Free App

Features

- Create shapes and polygons on Geomaps
  - Saved as Geospatial lookups
- Ability to create Splunk Alerts for Geofenced areas such as a campus or office locations.

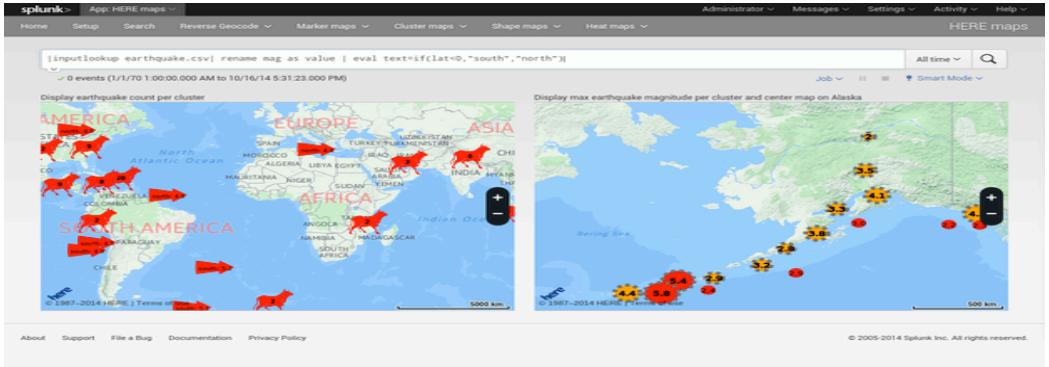


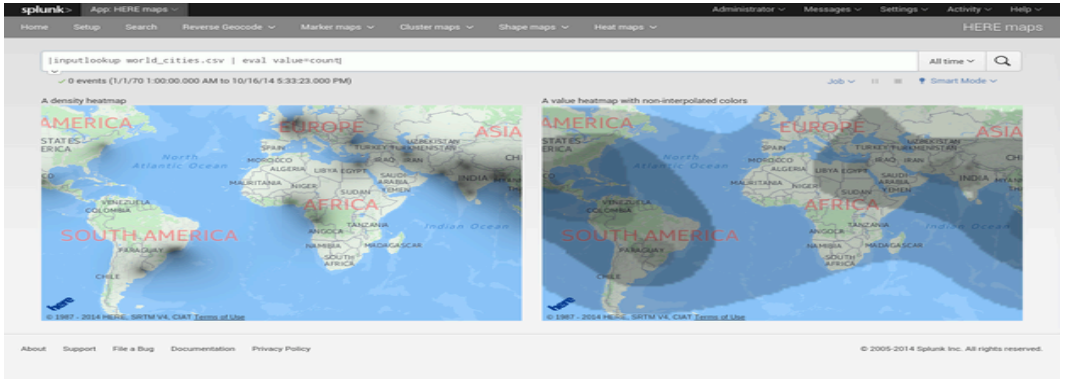
Here Maps

Free App (but needs a paid API to take full advantage)

Features

- Additional Visualizations
  - Marker Maps, cluster Maps, Heat Maps, etc
- Custom Iconography





Visualization

Visualization - Splunk Has Lots Of Options

Splunk Dashboards

Provide a multi-faceted view into data, makes the data look good

Large Data volumes – Grouping to the rescue

Afterglow – Flower blooms

Choropleth – Geo/Country boundaries

Fence in office locations or metropolitan areas

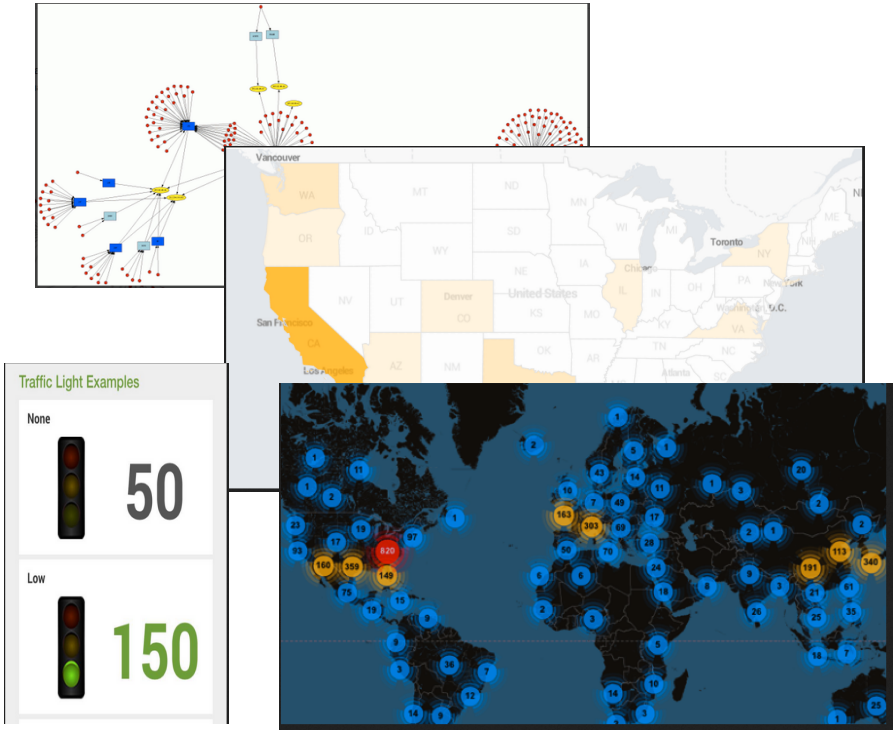
Countries of interest

Heat Maps – Focus areas

Identify concentrations of attacks/victims

TLP – High level visibility

Operating Status from a high level



Hunting Bad Guys

Hunting Bad Guys

- Easy Wins
  - Geo-location mapping
  - Dashboards with Lookups
  - Search Commands with external input – Reports, Dashboards, etc
- Advanced Wins
  - STIXX and TAXII feeds
  - Splunk REST API
  - IOCs, and Yara signatures Oh my!

Hunting Bad Guys

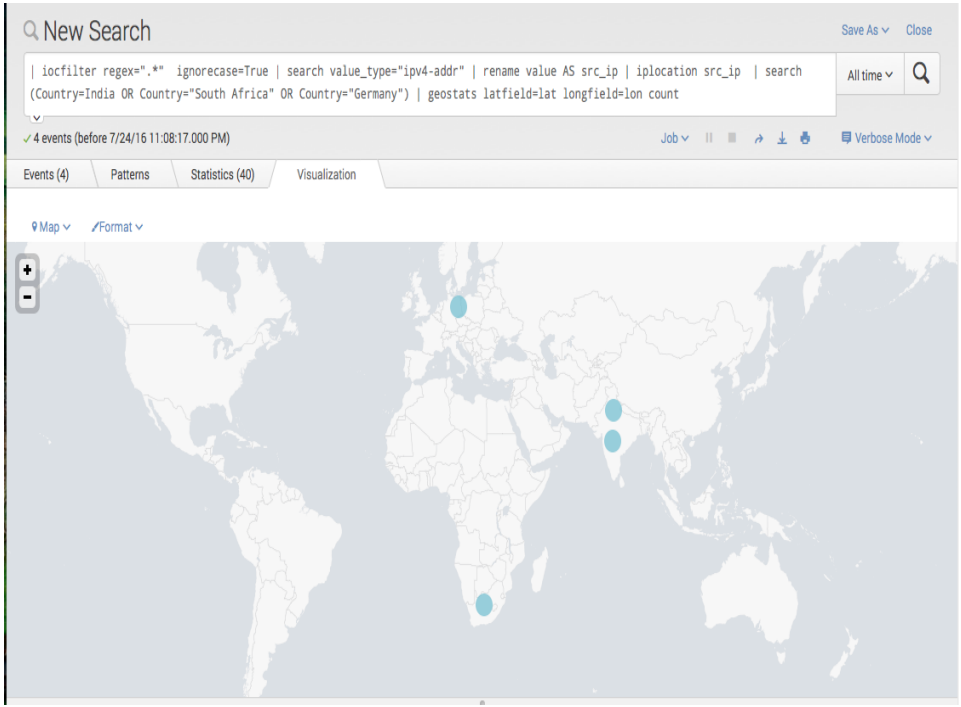
Easy Wins

Easy Win - Geo-location Mapping

- Simple Country filtering
  - | iplocation src_ip | search (Country=India OR Country="South Africa" OR Country="Germany") | geostats latfield=lat longfield=lon count
- Splunk embedded commands
  - iplocation/geostats
  - Geom Newer command

Geom - Allows for Geo-fencing framing via polygons

Geomfilter – geo-fencing limiting



Easy Wins - Dashboards With Content

- Dashboards with Lookups – Tor search script to dashboard
  - Enriching Dashboards with lookup data
    - Visualize Tor lookup via country/iplocation map and table
    - Embedded command - outputlookup create a lookup from dynamic data

- Search Commands with external input – Reports, Dashboards, etc
  - Interacting with other API's Lookups, search scripts and more

Dashboards With Lookups

External lookups - Tor lookup in Dashboard Panel

- Visualize Tor lookup via country/iplocation map and table

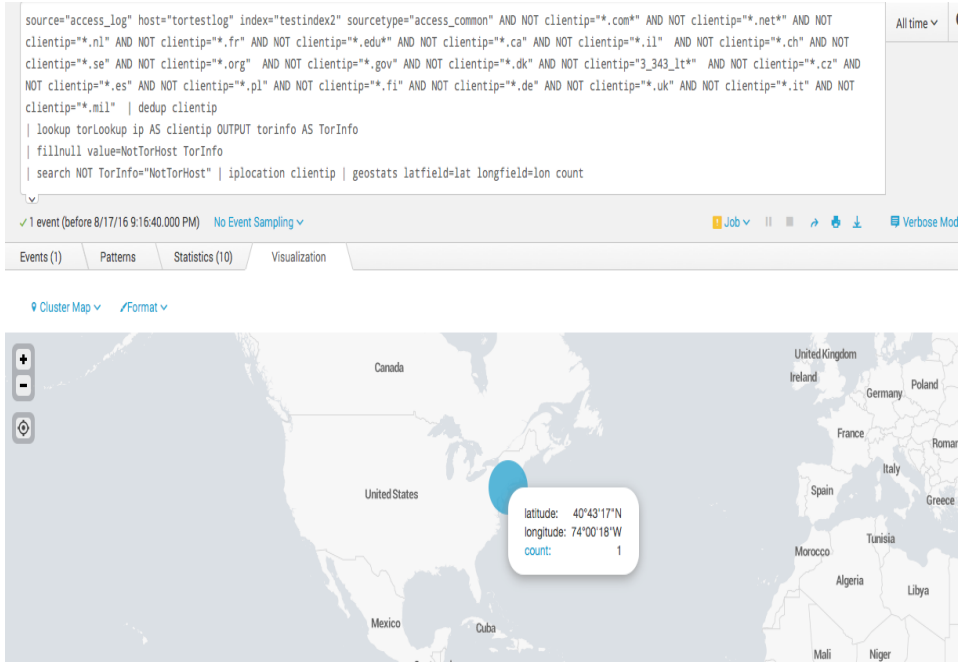
Examples:

- **Add content as a field**

Index=security_logs sourcetype=nids | lookup torlookup clientip OUTPUT torvalue | table alert, clientip, torvalue

- **Map NIDS alerts that are from Tor devices**

Index= security_logs sourcetype=nids | lookup torlookup clientip OUTPUT torvalue | search NOT torvalue="*NOT_TOR*" | iplocation clientip | geostats latfield=lat longfield=lon count



Create Dynamic Lists

Use Embedded Splunk command outputlookup

Use Outputlookup to take results from a search to create a lookup from dynamic data

Useful for building ‘correlated’ events

Example

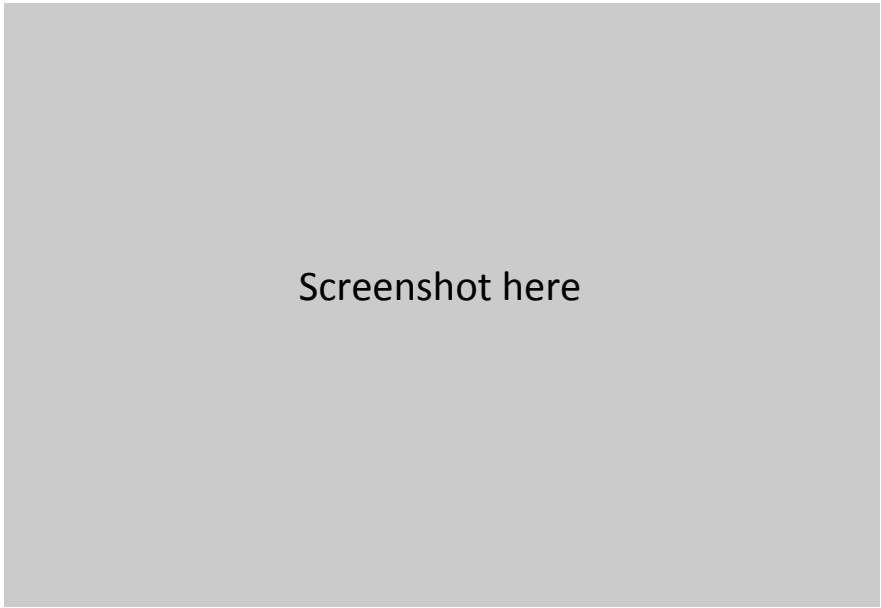
- IP’s from a specific NIDS signature add to a watchlist for VPN logins to monitor for attackers.

Fill in the lookup

Index=security_logs sourcetype=NIDS signature=“Cisco VPN DoS” | dedup src_ip | table src_ip | outputlookup CiscoVPNAttackers

Now search for the attackers in the VPN logs

Index=remote_access_logs sourcetype=cisco | lookup CiscoVPNAttackers src_ip OUTPUT ListVpnAttackers | where isnotnull(ListVpnAttackers) | table sourcetype, ListVpnAttackers



Interacting With External Commands

Interacting with other API's Lookups, search scripts and more

- Search for an IP address to see if it's part of the Tor

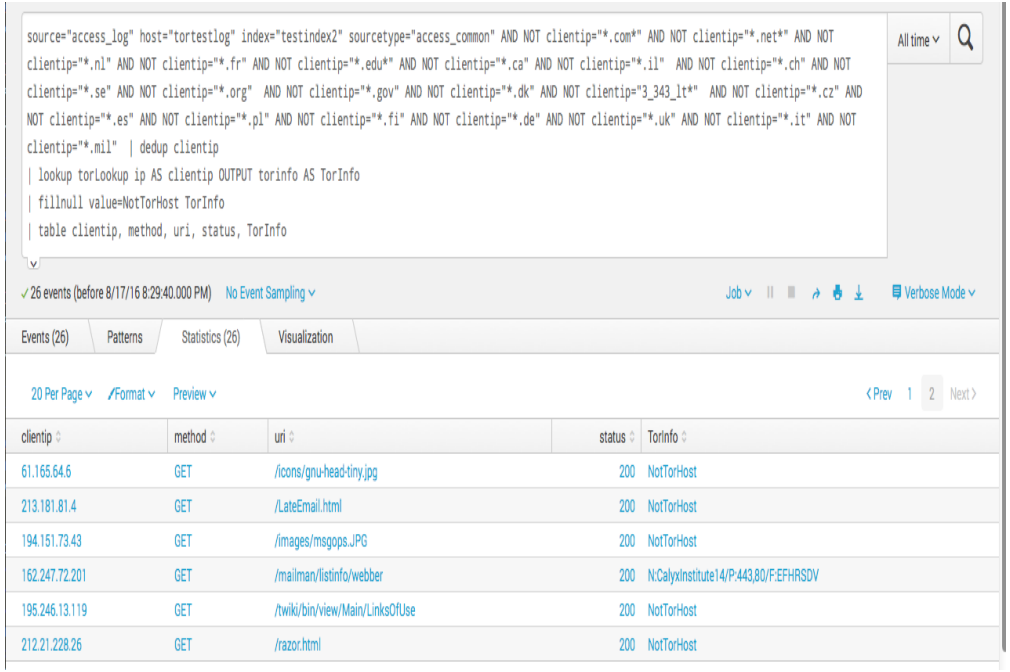
index=security_logs sourcetype=nids |
lookup torlookup ip AS clientip
OUTPUT torvalue AS TorInfo
| fillnull value=NotTorHost TorInfo
| table sourcetype. clientip, TorInfo

Positive Hit

```
200    N:CalyxInstitute14/P:443,80/F:EFHRSDV
```

Negative Hit

NotTorHost



Interacting With Multiple Field Output

Lookup BGP information for an IP – Taking the fight beyond your perimeter

- Show the BGP information to an IP
- BGP or Border Gateway Protocol
  - Short version
    - Routing around the world and among the Telecoms/ISPs
    - BGP contains IPv4 CIDR blocks within an ASN (Autonomous System Number)
    - Allows routing large segments of the internet
- Why Do we care?
  - What if you could block all of a phishing campaign by issuing one command for all of their IP ranges?

Searches for the BGP information for a given ip (Team Cymru Service) (others such as HE are available as well)
CLI:

python bgp_cymru.py <IP_address> <asnvalues>

Splunk:

index=security_logs sourcetype=nids | lookup bgp_lookup clientip OUTPUT BGPResults1, BGPResults2, BGPResults3, BGPResults4 | rename BGPResults1 as ASN, BGPResult2 as BGPOwner, BGPResult3 as BGPCountry, BGPResult4 as BGPCIDR

Example Output (Prototype For Now)
CLI:

python bgp_cymru.py 41.168.5.140 test

36937,Neotel-AS, ZA,41.168.0.0/16

Hunting Bad Guys

Advanced Wins

Indicator Management - Standards

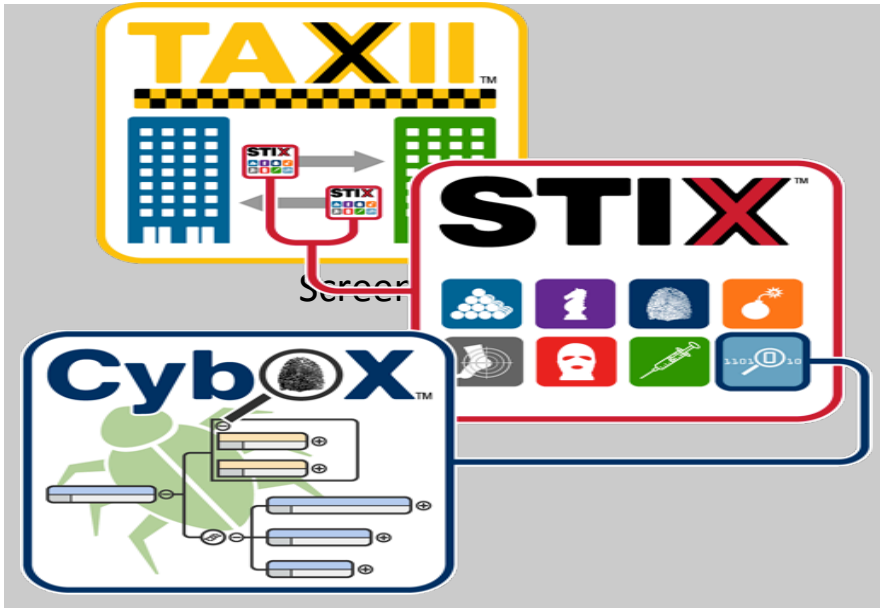
What is TAXII and STIX ?

TAXII - Trusted Automated eXchange of Indicator Information

STIX - Structured Threat Information eXpression

CybOX - Cyber Observable eXpression

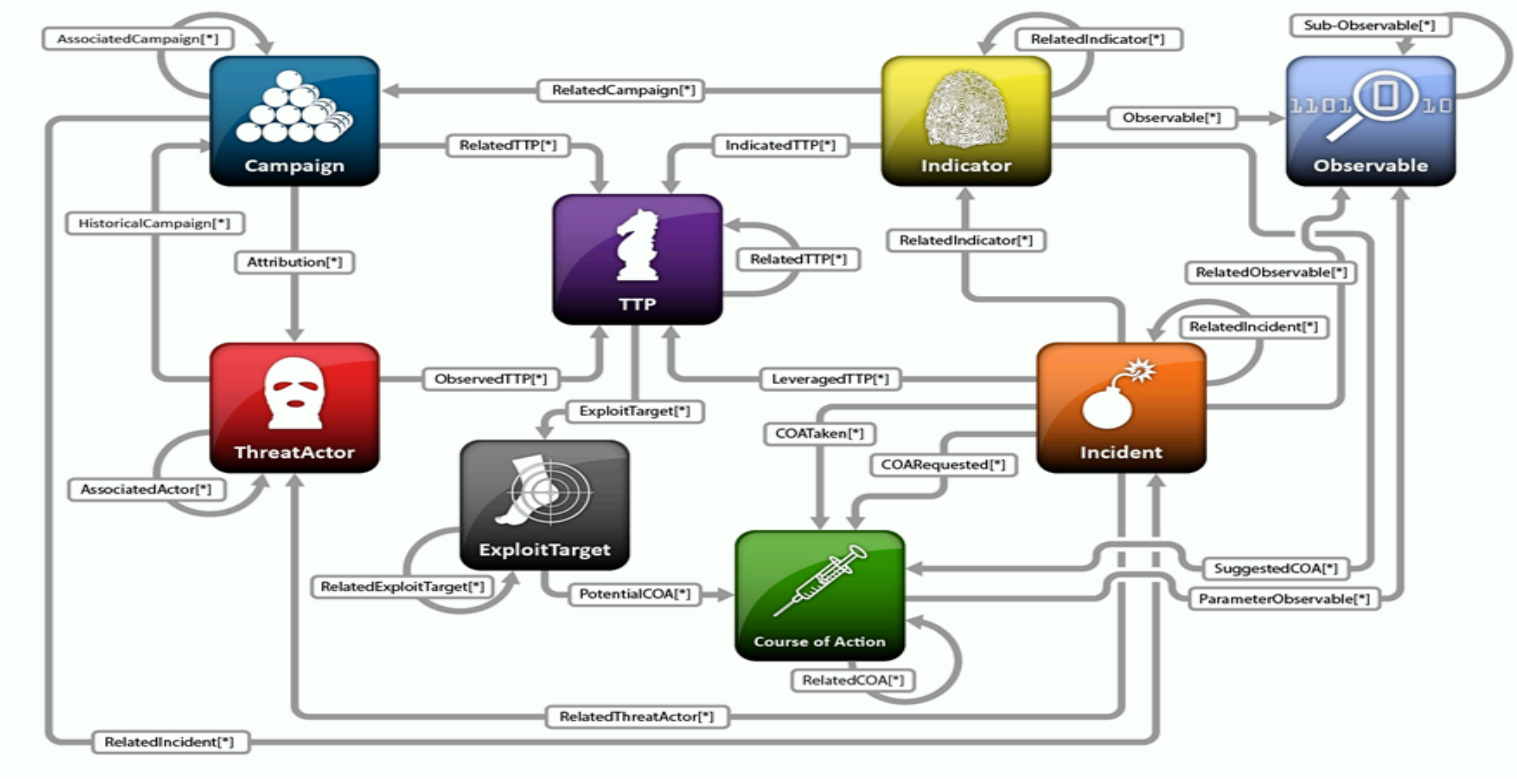
US-CERT Definitions and Icons



Advanced Wins

- STIXX and TAXII feeds
  - TAXII – The delivery system “Uber of Indicators” (vehicle used to transport indicators)
  - STIX – The person in the “Uber” (enriched indicators with content/ context labels)
  - CybOX – What the person is carrying (Threat Data Management)
- Splunk REST API
  - Using Splunk’s API to manage lookups
- IOCs, and Yara signatures Oh my!
  - Integration of other threat types

TAXII And STIX Ecosystem



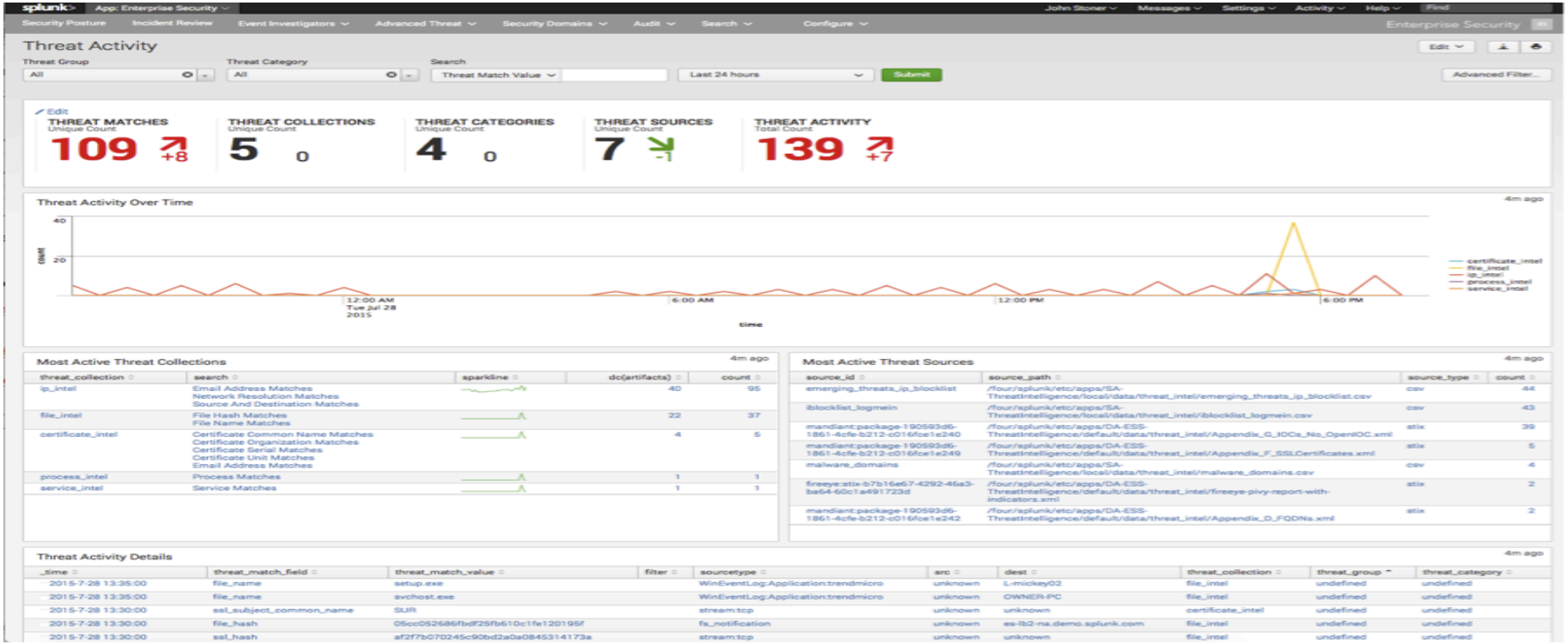
Threat Management - ES

Splunk ES (Enterprise Security)

- ES allows for integration of TAXII sources
- Creates several data models, accelerations and workflow (ES) integration

- Ships with an number of 'threat sources' that can be useful for demonstrating how to use Threat Feeds
- Supported Indicators Types
  - X509 Certificates
  - Email
  - Files names/hashes
  - HTTP
  - IP/Domains
  - Processes
  - Registry entries
  - Services
  - Users

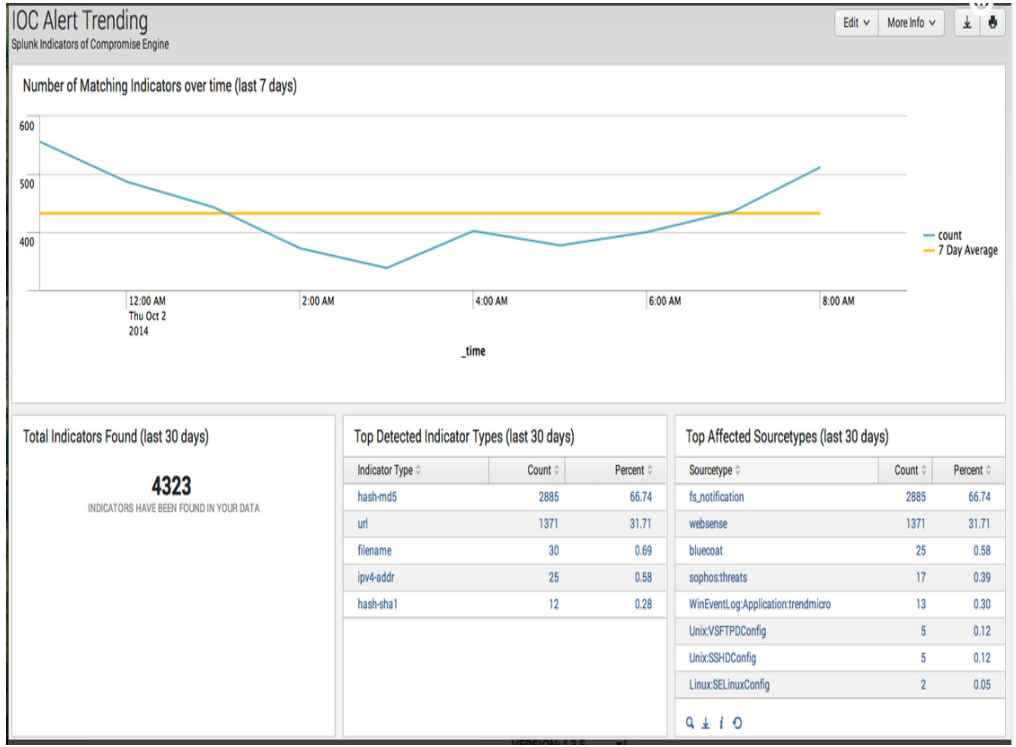
Splunk – ES Default App Dashboard



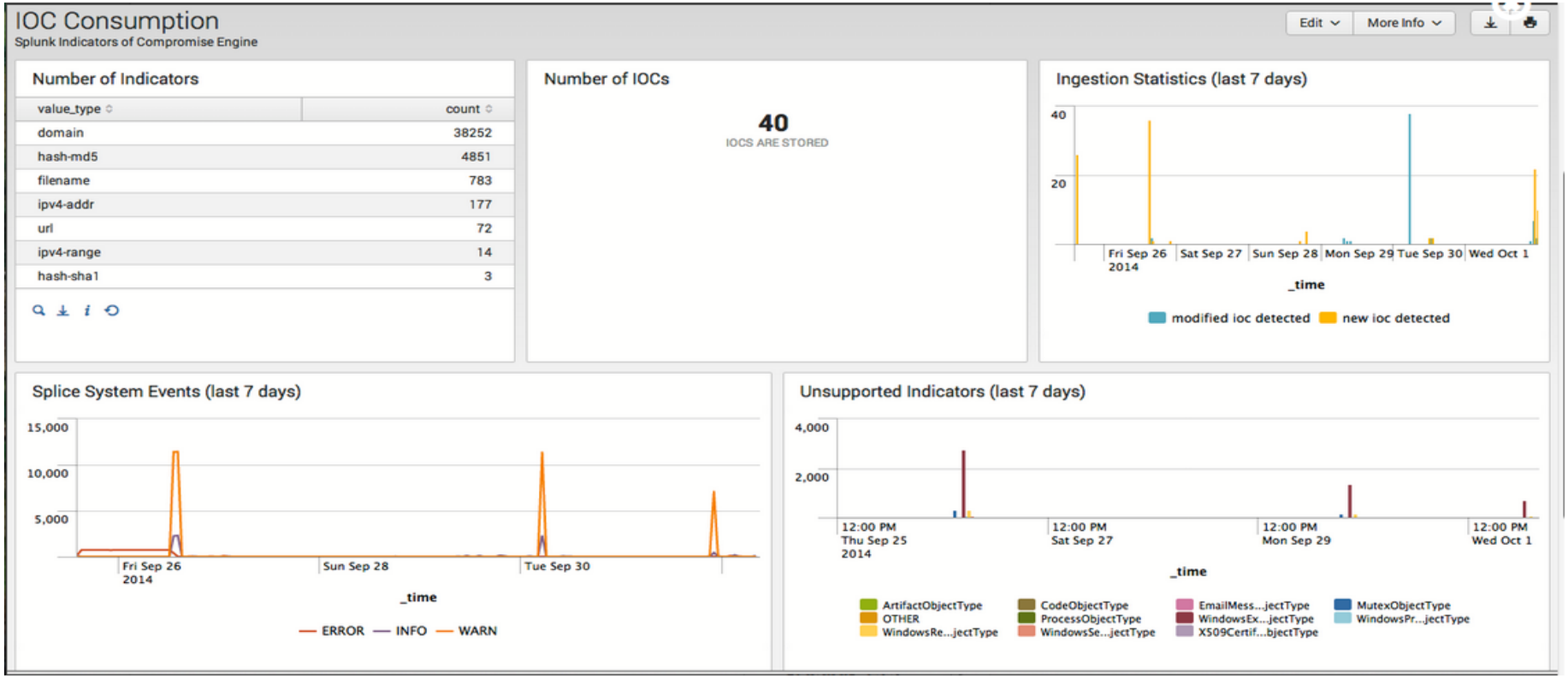
Threat Management – Splice

SA-Splice

- Splice has some of the features of a full ES deployment but is focused more on indicator management as it uses a stand alone MongoDB to store indicators.
- **NOTE: Splice also doesn't require the deployment to by CIM compliant, making it attractive to 'try' Threat Intelligence.**
- Adds several 'ioc*' specific commands to allow for searching and filtering of indicators.
- Great for small or low budget environments to enable integration of threat source information



SA-Splice – Default Dashboard



Splunk RESTful API

Splunk's REST API provides powerful access to Splunk.

Create/Edit Objects in Splunk
List and query indexes
| rest /services/data/indexes count=0
Run Searches

- Manage a lookup table?
  Now that's useful for security…

  Only have to upload the csv file to $SPLUNK_HOME to allow the REST API to access

- Splunk Documentation has several examples

List all of the lookup tables

curl -k -u admin:pass https://localhost:8089/servicesNS/admin/search/data/lookup-table-files

Modify a specific lookup table
*Warning – modifies by replacement
Good for indicators though

curl -k -u admin:pass \ https://localhost:8089/servicesNS/admin/search/data/lookup-table-files/lookup.csv \ -d eai:data=/opt/splunk/var/run/splunk/lookup_tmp/another-lookup-in-staging-dir.csv

Iocs, And Yara Signatures Oh My!

What other types of indicators of compromise (IOC) can Splunk use ?

- OpenIOC
  - A IOC standard proposed by Mandiant/ FireEye
  - XML based
  - Similar to STIX/CybOX

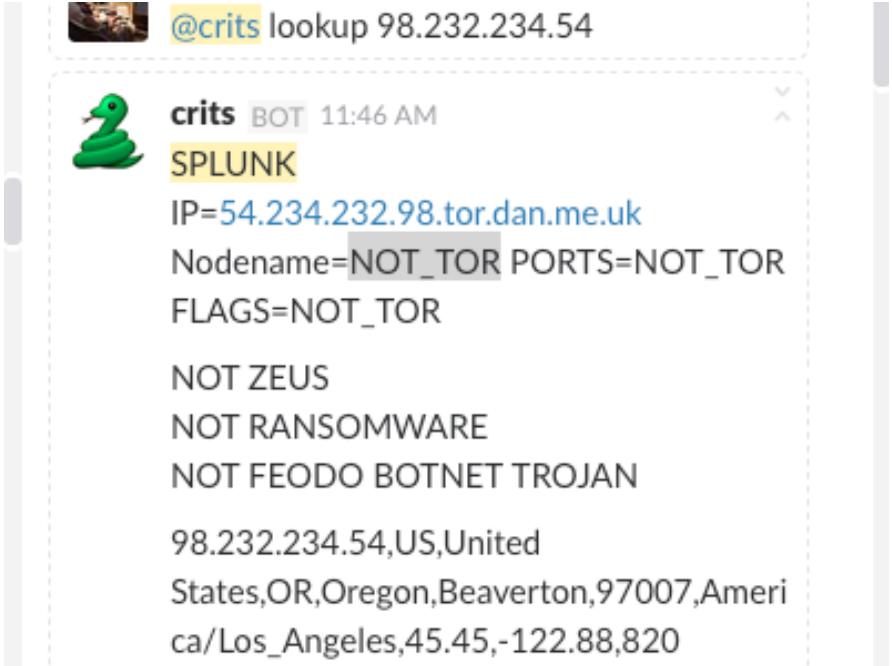
- Splice and ES can integrate these using a custom Data Input called IOC Mount
  - File based input for Splunk
  - Splice can parse and extract the indicators from the XML OpenIOC format

Example
-Uses Open Threat Service – IOCbucket.com
-Produce OpenIOC and Yara signatures
-Release IOCs via RSS streaming service
I created a Python script to subscribe, read, and decode the IOCs as they are published.
Script places them in a path for access by Splunk for parsing.
Yara - * Development *

```
ghostmobile:searchscripts jbabbin$ ls /opt/INDICATOR_LISTS/
ASN_Lists                       DNS_Lists                       Open_IOCs                       Splunk_Threat_List
CarbonBlack_Threat_Feeds        IP_Lists                        SSL_Lists                       libtaxii_client.py
ghostmobile:searchscripts jbabbin$ ls /opt/INDICATOR_LISTS/Open_IOCs/
6d2a1b03-b216-4cd8-9a9e-8827af6ebf93.ioc                    iocbucket_4b0e620a0099aa8cea619ba84ed5fd54b44f7aef_cridex banking malware.ioc
af2e8c80-13db-4a57-99ac-460ccd192333.ioc                    iocbucket_77c6895dde02b37b50b78e0326e07c9978a55980.ioc
iocbucket_08441c5d5f339359e526d6705465c30777092bda_xtreme rat.ioc    iocbucket_95c6df2e29186f0de13eaa1cae49cb8626fba9ae_ngrbot rootkit.ioc
iocbucket_2183166efc891d4014028fd0f10c46a4773efdfd.ioc      iocbucket_cdf7e4a7735d2505bd5c75ca5c23b50f57664ec2_ramnit rootkit.ioc
iocbucket_2224f9311a8b9bd6e051c485142a7dd2728cfc40_xtremerat.ioc
```

Threat Intelligence Platform Integration

- CRITS
  - MITRE developed and released Open-Source Threat management platform
- Can we integrate this with Splunk?
  - Experiment to use communications platform to query the TI platform, Splunk and access a 3rd party API
  - Successfully tested and produced by the Crypsis intern team in only a short period of time.



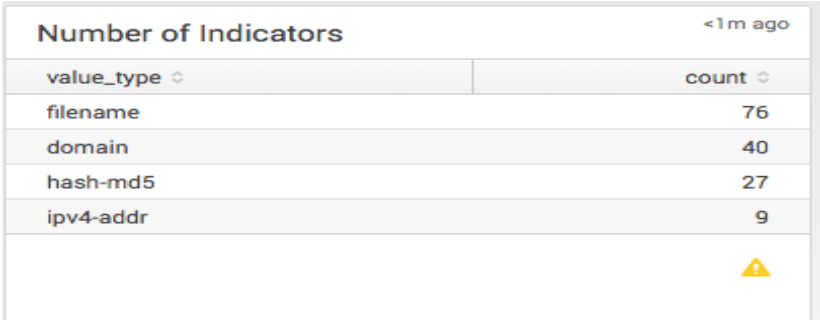
Future Ideas

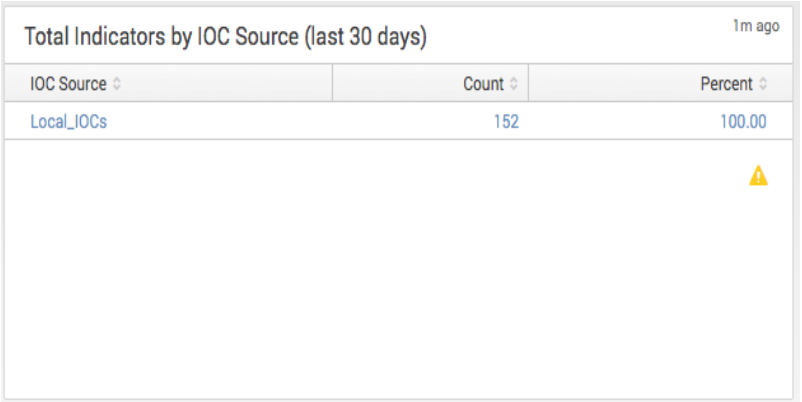
Future Ideas

- Event enrichment
  - Threat Source Evaluation
  - BGP Tagging
  - External Threat Management
    - CRITS, Soltra Edge, etc
  - Social Media – Keywords matched to Geo-location
    - Twitter text to content
- Enhanced Splunk extension
  - D3 Overview/Examples
- External Tools
  - Maltego Examples

Future - Threat Source Evaluation

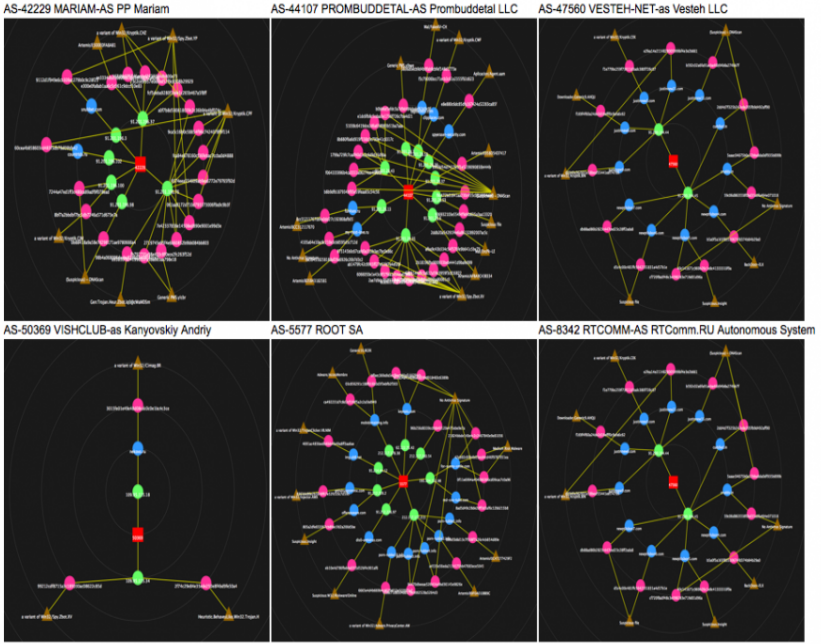
- Using Dashboards and Reports to show value of threat sources
  - How many IOC's are being triggered?
  - From which Threat Source?
  - What type of indicator Network? Host?
- Splice Provides several insights into the data via dashboards
  - IOC Consumption
  - *-ISAC data being used ?
    - Product a dashboard or report to show Indicators by Volume over time





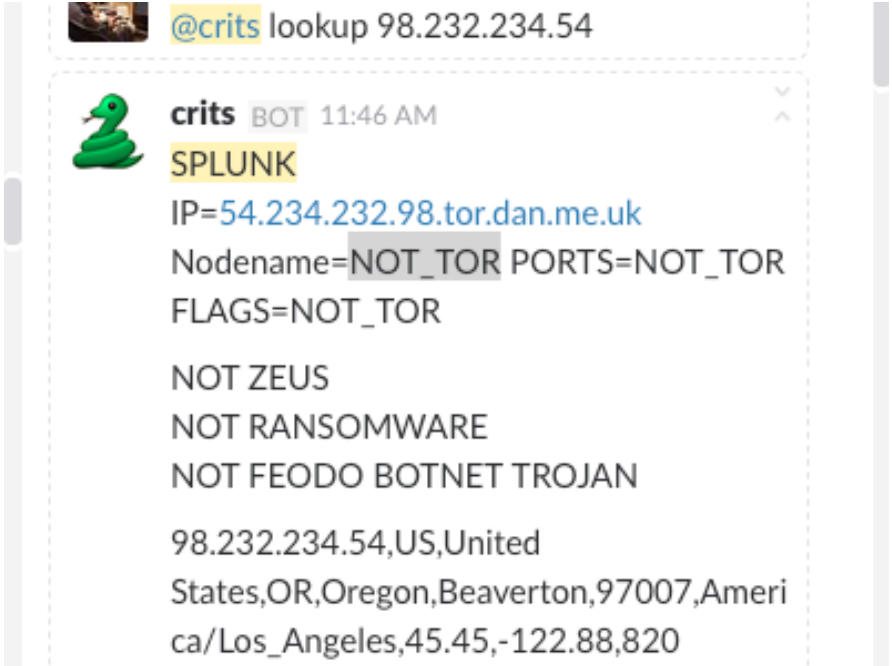
Future – Threats Outside Your Borders (BGP)

- BGP tagging
  - Search Scripts to perform BGP lookup for IP addresses
  - Extract or report on ASN owners or geo-location
- On the right is a takedown of a hostile network by ‘de-peering’ BGP routes to/from it
  - Afterglow splunk
  - Search BGP lookup results and then the peer AS list over time



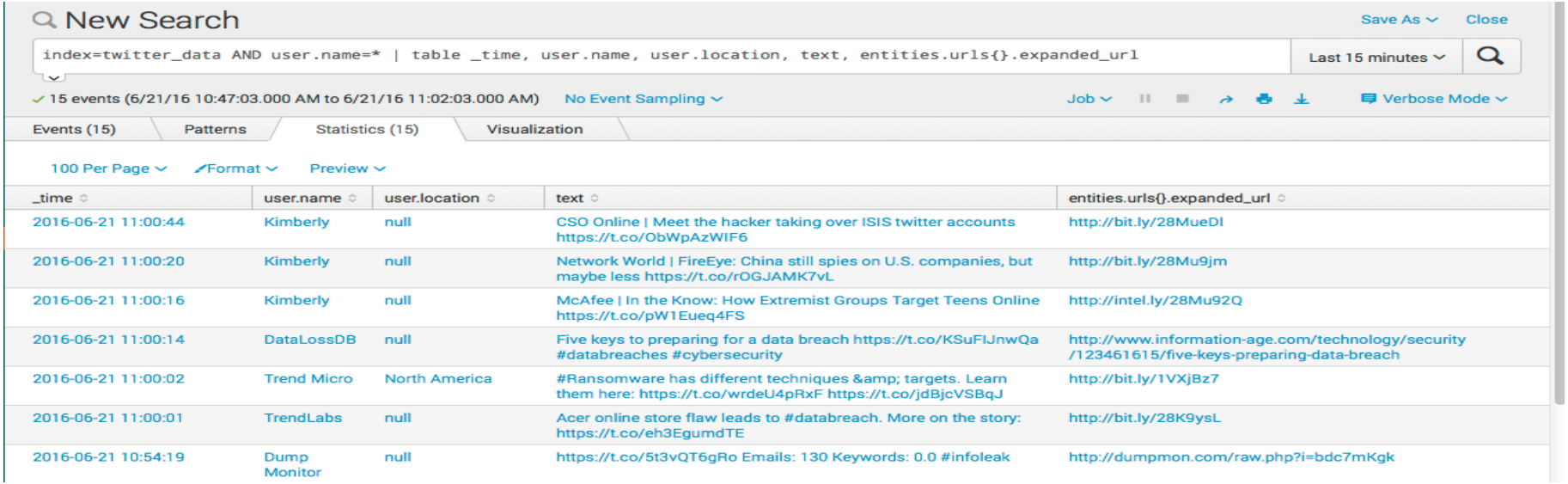
Future - Threat Management

- CRITS Integration with Splunk
  - Communications platform to query CRITS and Splunk
  - Splunk instance stores information such as Tor records
  - 3rd party API searches other data source
  - Return back to communications platform the information
  - -Other enhancements being worked out



Future - Social Media

- Lazy me – recording and tracking my twitter feed in Splunk
  - REST API as data input (It's only JSON right? ☺)
  - Store in index only for messages, urls and names for now
  - Run a lookup of 'dirty' words then add to alert
  - Generates a daily report of tweets per day



_time	user.name	user.location	text	entities.urls{}.expanded_url
2016-06-21 11:00:44	Kimberly	null	CSO Online | Meet the hacker taking over ISIS twitter accounts https://t.co/ObWpAzWIF6	http://bit.ly/28MueDl
2016-06-21 11:00:20	Kimberly	null	Network World | FireEye: China still spies on U.S. companies, but maybe less https://t.co/rOGJAMK7vL	http://bit.ly/28Mu9jm
2016-06-21 11:00:16	Kimberly	null	McAfee | In the Know: How Extremist Groups Target Teens Online https://t.co/pW1Eueq4FS	http://intel.ly/28Mu92Q
2016-06-21 11:00:14	DataLossDB	null	Five keys to preparing for a data breach https://t.co/KSuFIJnwQa #databreaches #cybersecurity	http://www.information-age.com/technology/security/123461615/five-keys-preparing-data-breach
2016-06-21 11:00:02	Trend Micro	North America	#Ransomware has different techniques & targets. Learn them here: https://t.co/wrdeU4pRxF https://t.co/jdBjcVSBqJ	http://bit.ly/1VXjBz7
2016-06-21 11:00:01	TrendLabs	null	Acer online store flaw leads to #databreach. More on the story: https://t.co/eh3EgumdTE	http://bit.ly/28K9ysL
2016-06-21 10:54:19	Dump Monitor	null	https://t.co/5t3vQT6gRo Emails: 130 Keywords: 0.0 #infoleak	http://dumpmon.com/raw.php?i=bdc7mKgk

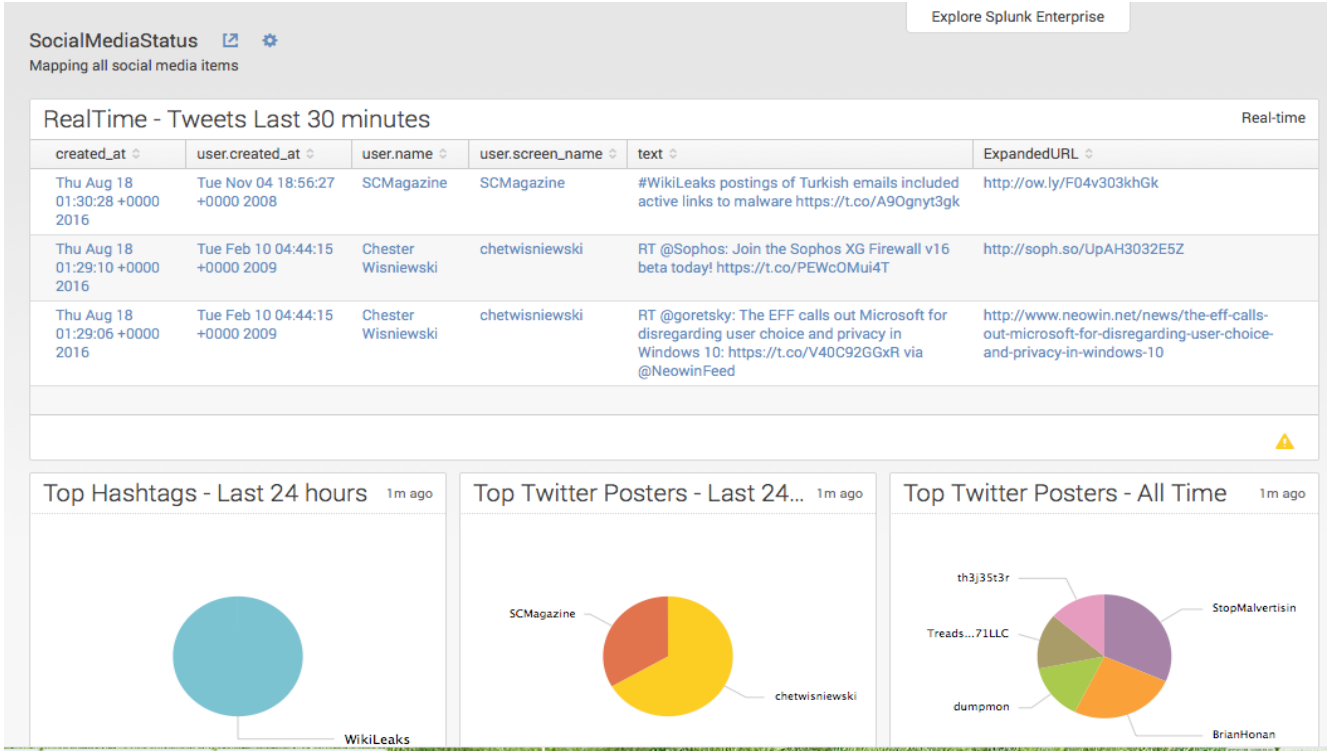
Future – Social Media Dashboard

Quick Stats

Last 30 minutes of tweets

Last 24 Hours
- Top Hashtags
- Top Posters

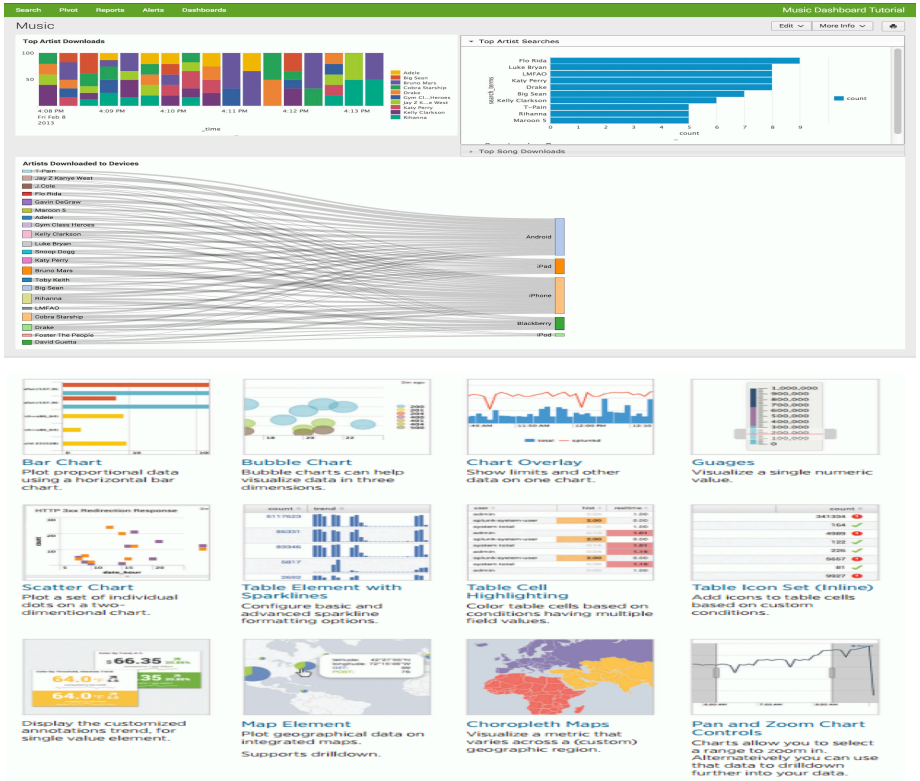
All Time
- Top Poster



Enhanced Splunk Visualization

- What is D3?
  ***D3 (Data-Driven Documents** or **D3.js**) is a JavaScript library for visualizing data using web standards.*
- How does Splunk use this?
  - To make really cool visualizations!
  - Detailed discussion

  Splunk conf2014 - Splunk for Data Science
- Ideas - Splunk Apps
  - The Web Framework (1613)
  - D3 Extension (2856)



External Examples

- Maltego
  - A rich link analysis platform that handles data from multiple sources including Splunk and external API's
  - Great tool to map out campaigns or visualize disparate data into relationships
  - Cheap!
  - Home: http://www.paterva.com
- Examples
  - Example 1 – Bad Guys who Share infrastructure
  - Example 2 - Those Random cases can't be related?
  - Example 3 – When Phishers show their hand

External Examples

Example 1 – Bad Guys Who Share Infrastructure

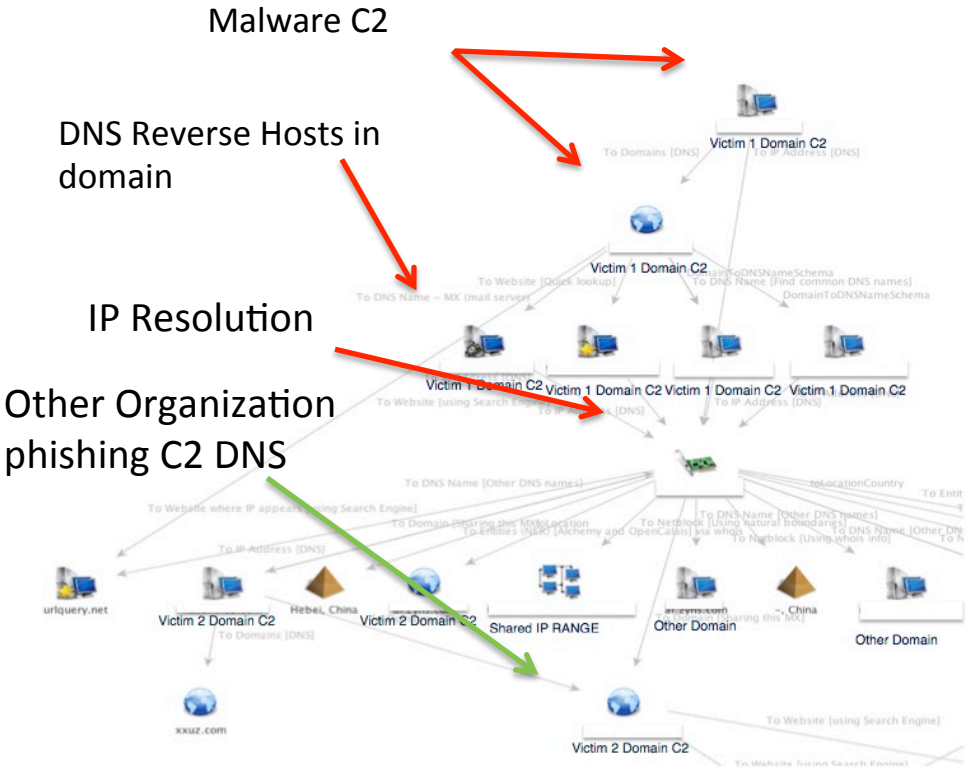
- Goal:

  Determine if targeted malware communications (C2 traffic) from one victim site has any associations to other attacks.

- Discovered:

Malware shared network infrastructure for multiple attacks

Found a newly created Domain that indicated another victim. Contacted their security team and discovered they were just starting an investigation into a spear phishing campaign that was launched earlier in the day!



Example 2 - Those Random Cases Can't Be Related?

- Goal:
  - Take a random sample of IP's and Domain names, and hashes to see if anything is related
- Discovered:

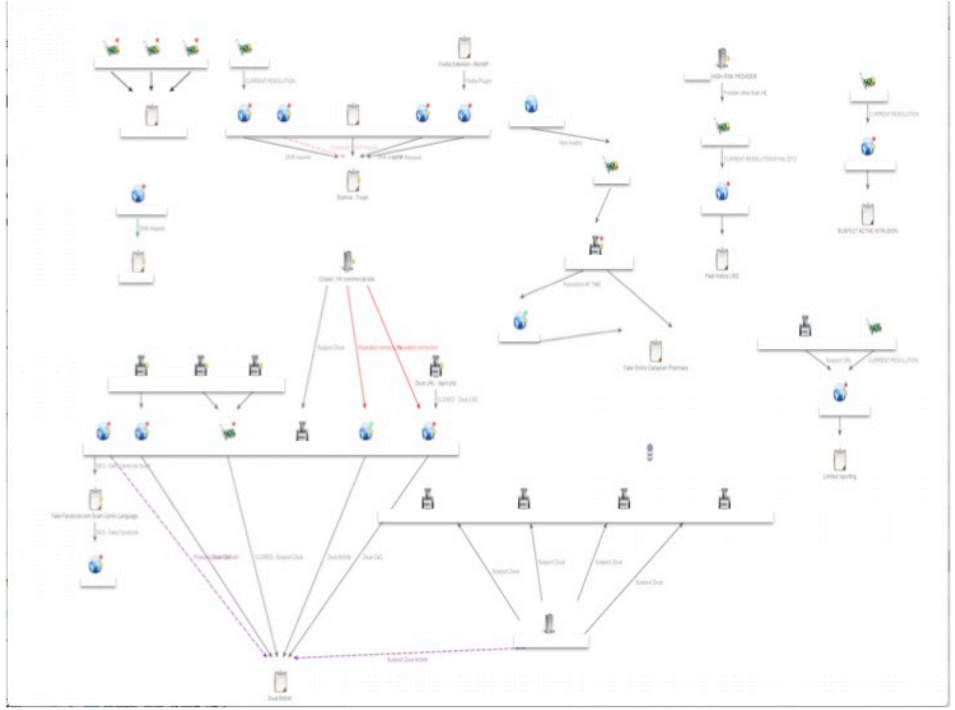
  Of the sample set

  8 of the indicators were related to the same Zeus Family of Malware

  1 Cyrillic language Fake Facebook login (only worked from EU IP's)

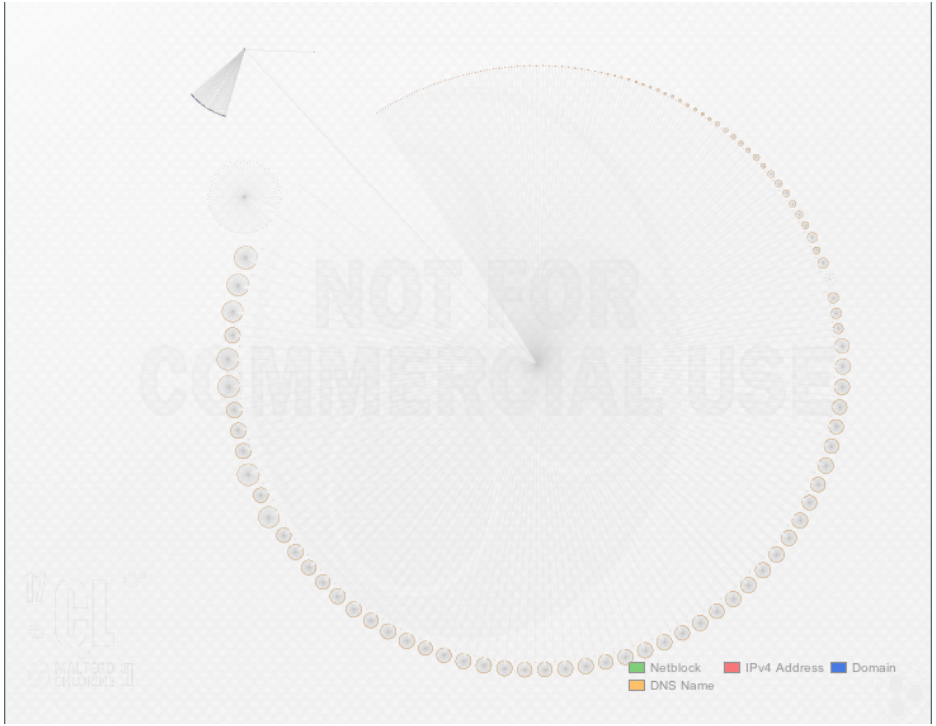
  1 Fake Canadian Pharmacy Scam (PII stealing malware)

  1 Active intrusion with C2 information to a US Military site



Example 3 – When Phishers Show Their Hand

- Goal:
  - Investigate source of Spam email (originating sender)
  - DNS name: mail.atlanticrisk.com
- Discovered:
  - Hosted server in the Cayman Islands
  - DNS Resolutions showed several thousand Domains being parked on this server.
  - Including several faked Banking scams (BoA, WF, HSBC, and more)
  - Joy for us the phishers had only placed the files there.
  - Visible was still the C2's and email templates for the phish campaign.
  - Turned over all domains for Blocking, Shared the phishing campaign details with several Banks and handed over the Server information for takedown.



Conclusions

- Visualization can help play a key role in cyber events
- Splunk has wide variety of options that can help an organization, a security, and even an analyst to visualize, enrich, and present data.
- Combining these into data enables faster, and more accurate identification of threats and attack(s/ers)
- More work can be done to improve or provide additional solutions.
- Creativity is your only limit.

What Now?

Related breakout sessions and activities…

- CHECK WITH SPLUNK SCHEDULE FOR RELATED TOPICS TO POINT PEOPLE TOWARD

Questions/Comments?

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The Crypsis Group

THANK YOU

splunk>