Watchers on the Wall

How to Safely Share Content with Wildlings on a Multi-Tenant Platform

SCREENERS.COM
BY SHIFT

SafeStream

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Our Realm

Dozens of content owners
- Majors
- Independents
- Service providers and vendors

...forced to cooperate to defend themselves

Screeners application
- Thousands of viewers, mainly press
- Web and Apple TV front ends
- Admin web UI for PR teams to manage it all
- Multi-cloud

Content ripe for piracy
- Many popular shows
- In their final form

Decent Controls

- Passwordless Login
  - No password to compromise
- Visual Watermark
  - Deter against leaks
- Forensic Watermark
  - Track when we need to

Plus...

The Wall

- MFA
- Geofencing
- VPN
- Hardened Devices
- Encryption all over
- Pen Tests
- Appsec Scans
- Vulnerability Management
- Audits
- Code Review
- Training
- Testing

But...

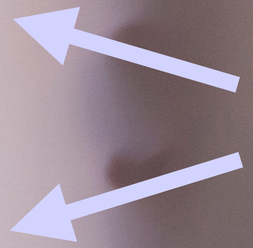
We Must Go Beyond the Wall

Into the haunted forests

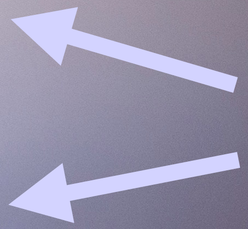
- We have to share content
- On the open internet
- Where pirates are kings
- And everyone gets hacked

Five Threats to Consider

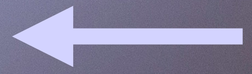
1. Authorized user leaks content
   - Accidentally by over sharing
   - Accidentally through carelessness
   - On purpose by screencapping
2. Attacker compromises authorized user
   - Probably phishes their email
3. Attacker breaks into application
   - May be an authorized user or not
4. Attacker breaks into infrastructure
5. Social engineering / inside job



User Credentials



Break-ins



Employee Credentials

Watchers on the Wall

Monitoring as a general purpose compensating control

Flexible

- Can be applied to many threat models

Can start small

- Build up to more sophistication

Includes humans

- Leverages our paranoia and judgment

Good toolsets available

Example 1

Anomalous Activity Monitoring

Addresses authorized users' use of our systems

User Credentials

Inputs:

- Client side UI tracking
- Server side request tracking
  - Authentication
  - Playback
- Video QoS tracking data

Example 1 - Anomalous Activity Monitoring

- Analyze typical user activity

- Set threshold alerts
  - Number of locations
  - Number of devices
  - Number of views per time period
  - etc.

- Investigate alarms using an SOP
  - But also your brain

- Correlate with session tracking and replay tools

- Spot check on an ongoing basis

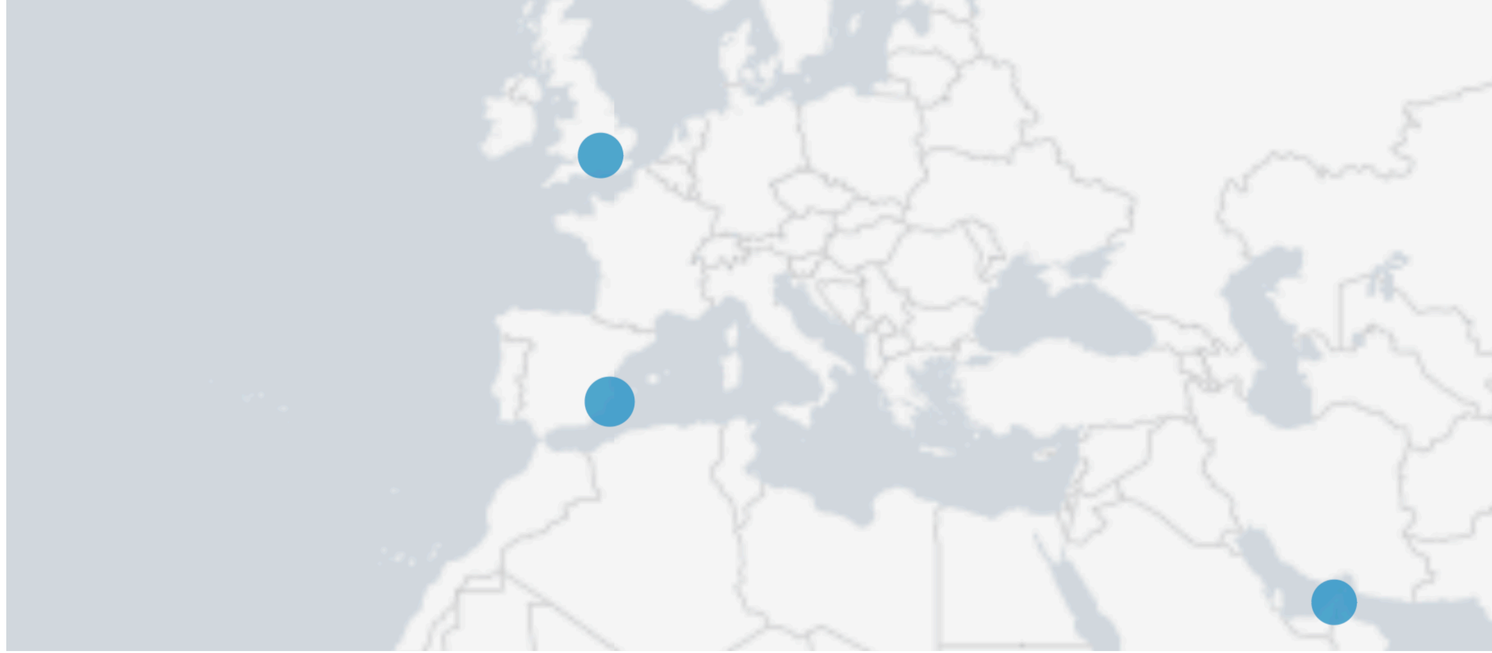
Example 1 - Anomalous Activity Monitoring

Alert: Users exceeding location threshold (Real time)

EmailRequestingLink	ContentProvider	NumberOfLinksRequested
[redacted]@[redacted].com	[redacted]	4
[redacted].com		5
[redacted].com		4
[redacted]om		5
[redacted]@gmail.com		4
[redacted].com		4
[redacted]@gmail.com		4
[redacted].com		4

strf_time	stall_span_minutes	watermarked_by_email	ip_address	ip_user_type	City	Region	Country	video_id	total_noticable_stalls	total_delay_seconds	delay_rate
07-23-2018 3:49 PM	15.5235	tr[redacted]@gmail.com	[redacted].189	college	Baltimore	Maryland	United States	bfb160ed-263f-4964-8089-ccd52a1d2c25	25	126.187	0.135480
07-23-2018 3:56 AM	3.11368	ro[redacted]@latimes.com	[redacted].35	residential	Los Angeles	California	United States	0946c39e-5926-4895-9bf0-0af35ee4bf0e	2	1.567	0.008388
07-23-2018 4:45 PM	0.000	[redacted]film@gmail.com	[redacted].5	residential	Southbridge	Massachusetts	United States	c5baf7c1-5dfb-482b-827b-d11cc37a9b35	1	1.227	
07-23-2018 5:13 AM	21.82228	[redacted]@tangmp.com	[redacted].6	residential	Los Angeles	California	United States	04b13bc2-9b37-4423-b5b5-36db2d8358d3	26	160.544	0.122615
07-23-2018 5:24 PM	0.000	le[redacted]@gmail.com	[redacted].218	residential	Elmhurst	New York	United States	927a38ec-39fc-41c8-bfb8-8022125c75db	1	2.088	
07-23-2018 5:39 PM	0.000	so[redacted]@condenast.com	[redacted].113	residential	Stamford	Connecticut	United States	bfb160ed-263f-4964-8089-ccd52a1d2c25	1	0.593	
07-23-2018 5:41 PM	46.64187	si[redacted]@sky.de	[redacted].19	residential	Munich	Bavaria	Germany	31007afc-efd3-4598-bfb4-82375363f3b2	8	52.557	0.018780
07-23-2018 5:59 PM	16.84778	w[redacted]@gmail.com	[redacted].130	residential	London	Ontario	Canada	2f41d8ec-f723-42dd-b809-0e59b9d3401a	2	17.916	0.017723

Example 1 - Anomalous Activity Monitoring



Activity Reviewed:

USER: [redacted]@[redacted].com

Previous observations:

First request for magic link sent 11/12/2018. No content viewed until 11/16/2018. User is a top viewer. User has records of viewing from 2 devices in tandem, one on a cellular network. 3 IPs, 3 devices, 2 regions.

Current observations:

No new activity from this user since initial observation. User will remain flagged for further observation.

>>>Flagged for further observation.

Example 1 - Anomalous Activity Monitoring

Results

- Be vigilant
- We do find suspicious activity
- Some activity is legit but looks very suspicious
  - Certain VPNs
  - Client machines in public cloud
- Requires constant improvement

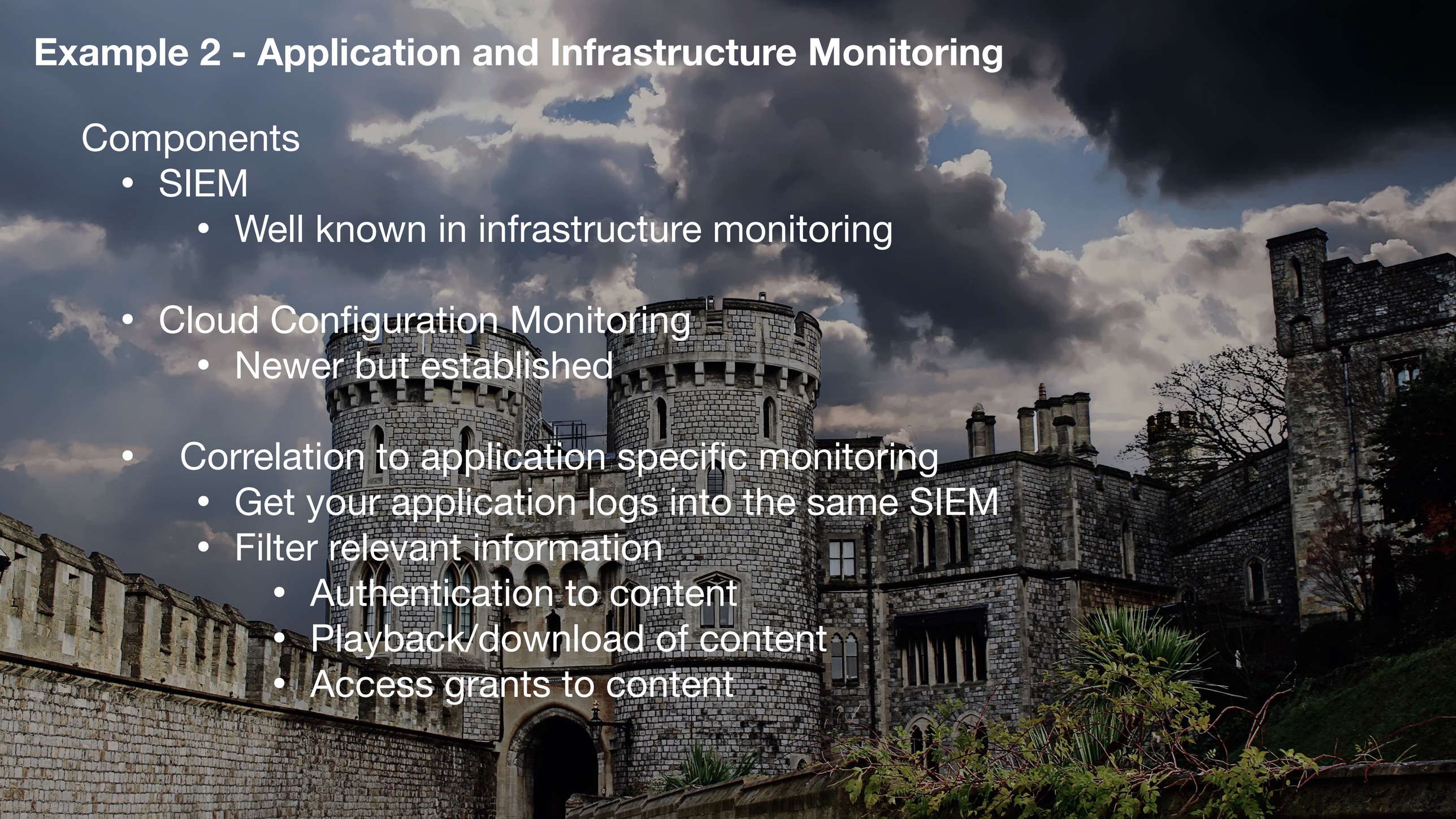
Example 2

Application and Infrastructure Monitoring

Addresses attempts at unauthorized access to our systems

Break-ins

Example 2 - Application and Infrastructure Monitoring



Components

- SIEM
  - Well known in infrastructure monitoring
- Cloud Configuration Monitoring
  - Newer but established
- Correlation to application specific monitoring
  - Get your application logs into the same SIEM
  - Filter relevant information
    - Authentication to content
    - Playback/download of content
    - Access grants to content

Example 2 - Application and Infrastructure Monitoring

Overview

LIVE MODE [From Panel]

Activity by Source Location

Last 30 Days

Total Login Failures

Last 30 Days

138

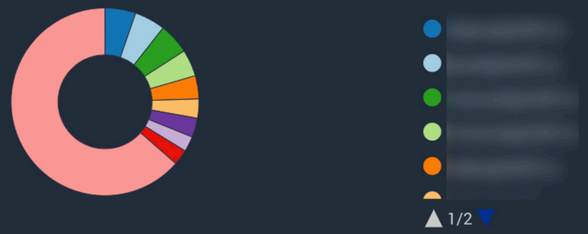
Top Login Failure Reasons

Last 30 Days

#	eventName	login_failure_type	login_type	eventCount
1	login_verification	passed		130
2	login_challenge	passed		5
3	login_verification	incorrect_answer_entered		3

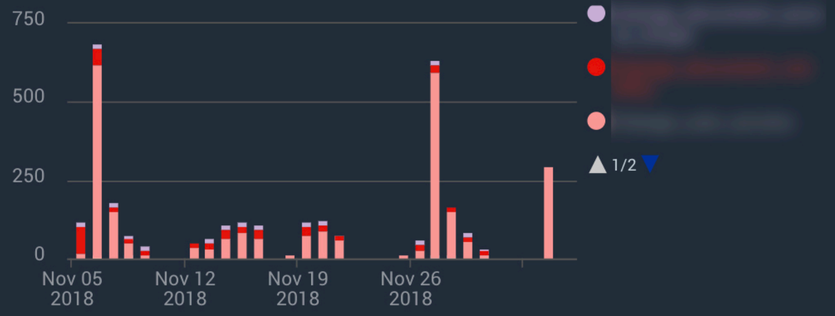
Logins from Multiple IPs

Last 30 Days



ACL Changes

Last 30 Days



Login Failures by User

Last 30 Days

Logins from Multiple IPs

Last 30 Days

#	email	DistinctIPs	LoginCount
1		8	69

Top Event Name by Event Type

Last 30 Days

#	eventType	eventName	eventCount	_rank
1	DOMAIN_SETTINGS		1	1

Top Apps

Last 30 Days

Example 2 - Application and Infrastructure Monitoring

Amazon GuardDuty - Overview

LIVE MODE | Last 30 Days

Guard Duty Threat Map

Last 30 Days

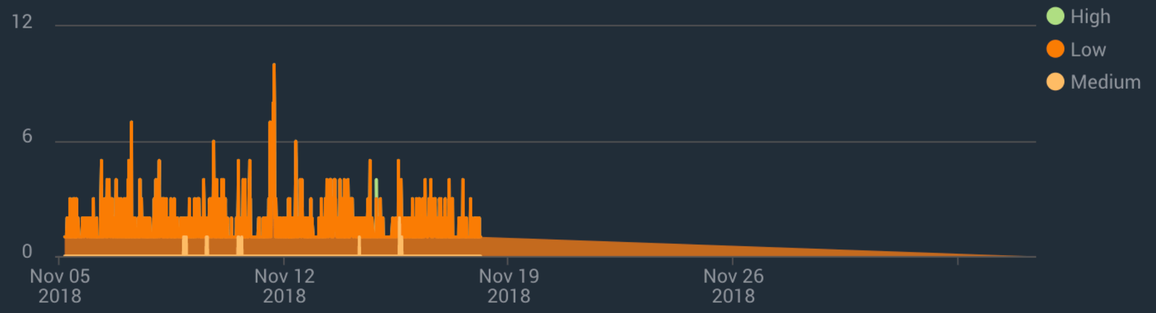
High Severity Threats Table

Last 30 Days

#	Time	accountID	region	ResourceType	description	link
1	12/03/2018 10:57:00 AM -0500		us-east-1	EC2		https://us-east-1.console.aws.amazon.com/ec2/v2/home?region=us-east-1#Instances:search=i-
2	11/14/2018 9:35:00 PM -0500		us-east-1	EC2		https://us-east-1.console.aws.amazon.com/ec2/v2/home?region=us-east-1#Instances:search=i-
3	11/14/2018 9:11:00 PM -0500		us-east-1	EC2		https://us-east-1.console.aws.amazon.com/ec2/v2/home?region=us-east-1#Instances:search=i-
4	11/14/2018 8:45:00 PM -0500		us-east-1	EC2		https://us-east-1.console.aws.amazon.com/ec2/v2/home?region=us-east-1#Instances:search=i-

Severity Trend

Last 30 Days



Threats by ThreatPurpose, ResourceType, ThreatName

Last 30 Days

#	ThreatPurpose	ResourceType	ThreatName	count
1	Recon	EC2	PortProbeUnprotectedPort	3,785
2	UnauthorizedAccess	EC2	SSHBruteForce	43
3	UnauthorizedAccess	IAMUser	UnusualASNCaller	33
4	Behavior	EC2	NetworkPortUnusual	5
5	Trojan	EC2	DNSDataExfiltration	4
6	Recon	EC2	Portscan	1

Threats by IP

Last 30 Days

Severity and AccountID

Last 30 Days

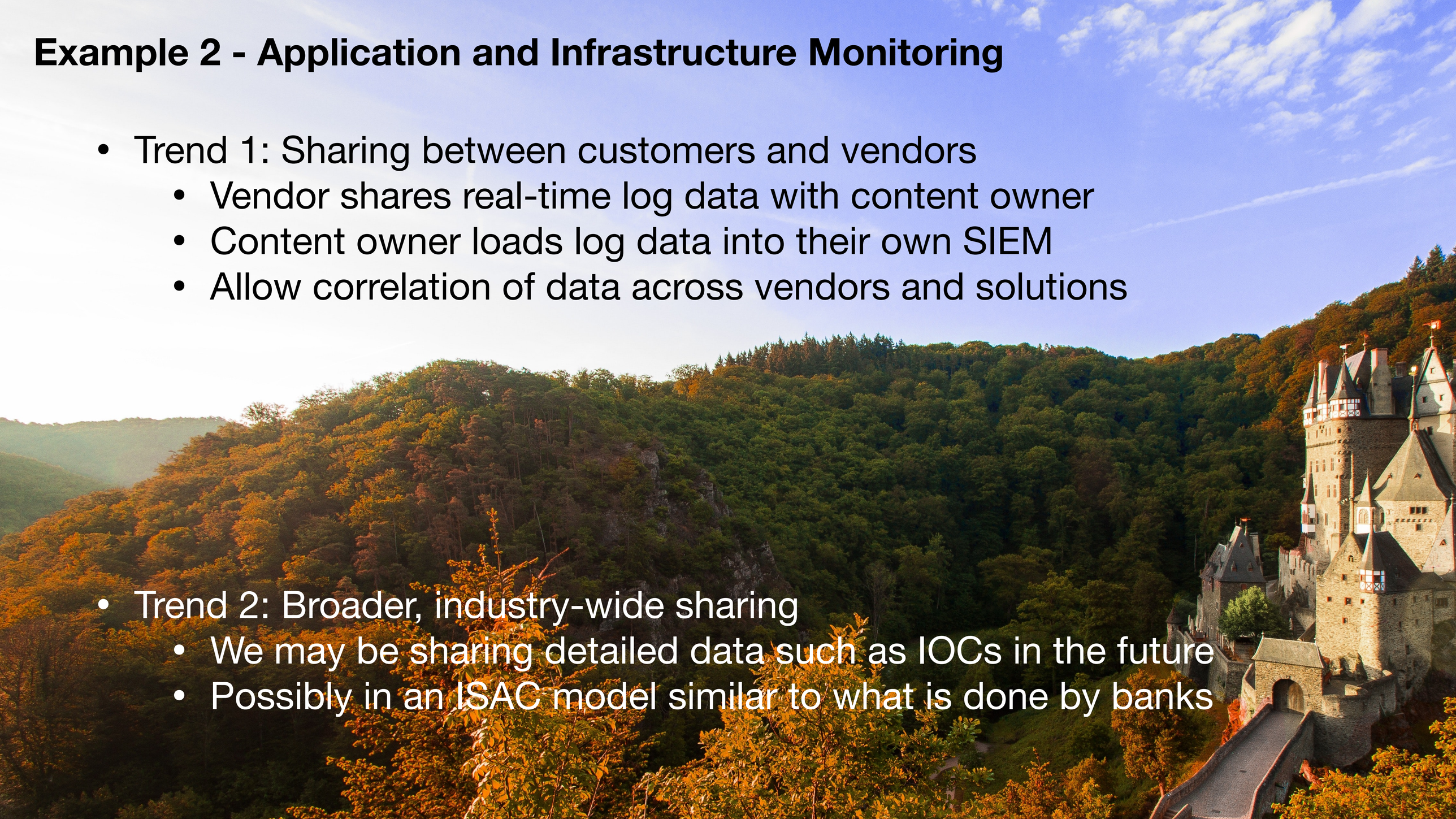
Severity and Region

Last 30 Days

Severity and ResourceType

Example 2 - Application and Infrastructure Monitoring

- Trend 1: Sharing between customers and vendors
  - Vendor shares real-time log data with content owner
  - Content owner loads log data into their own SIEM
  - Allow correlation of data across vendors and solutions



- Trend 2: Broader, industry-wide sharing
  - We may be sharing detailed data such as IOCs in the future
  - Possibly in an ISAC model similar to what is done by banks

Example 3

Controlling Internal Use

Addresses employees' use of our systems

Employee Credentials

Example threats

- Compromised endpoint (malware)
- Compromised employee credentials

Challenge -
Provide enterprise grade security, operating as a small company who is a vendor to large enterprises

Example 3 - Controlling Internal Use

Simplify - Settle on one simple, trainable tool for each control

- Password vault with sharing
- Identity Management
- SSO authentication
- VPN
- Patch management
- Anti-malware

Tiered privilege requires tiered controls

- Privileged access users get more controls
  - Deeper background checks and competence vetting
  - More frequent endpoint scans
  - Higher severity alerts in the case of any anomaly
  - Retraining right away when it changes

Example 3 - Controlling Internal Use

Details | Refresh details | Edit details

Name: alex_nauda-mbp13
Model: MacBook Pro
Serial: [redacted]
Warranty: Apple
Tags: BOS OWN
Auto tags: Mac devices
Owner: Set an owner

SM Agent

Up to date: Yes

OS

Version: OS X 10.14
Uptime: 23h 33m 55s
Last user: -

Security

Encryption: Enabled
-
Firewall: -
Login required: Yes
Auto login: Disabled
Screen lock: Enabled
Screen lock delay: 9 minutes
Security policies: filevault | login_req | firewall | jumpcloud

Management

Settings: up-to-date
Enrollment date: 12:58 Jun 20 2017

Storage

/dev/disk1s1:	143.4 GB / 931.5 GB	15%
/dev/disk1s2:	67.1 MB / 931.5 GB	0%
/dev/disk1s4:	3.0 GB / 931.5 GB	0%

Network

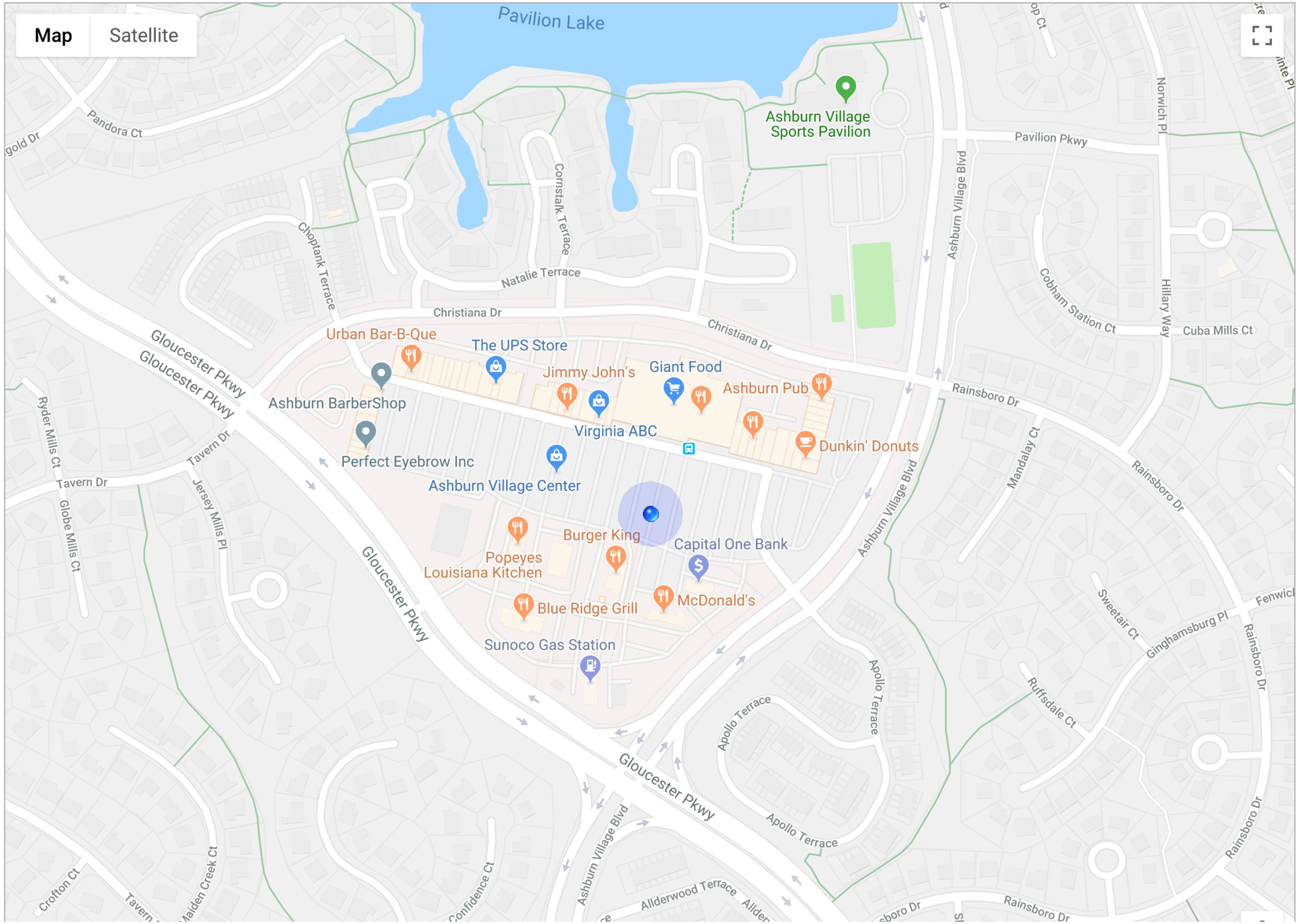
LAN IP: [redacted]
Public IP: [redacted]
Wireless adapter: Airport Extreme
Bluetooth MAC: [redacted]

Online status | ▶ Check-in now

Agent last online: Dec 04 2018 14:50

Approximate location | Refresh location

Ashburn, VA (via IP, updated about 3 hours ago)



Example 3 - Controlling Internal Use

Dashboard | Analysis | Outbreak Control | Management | Accounts | Search

Dashboard

Compromise Events (Default) | Reset | New Filter

Dashboard | Inbox | Overview | Events

Time Period | 14 days | Refresh All | Auto-Refresh

0% compromised

Inbox Status

0 Require Attention | 0 In Progress | 0 Resolved

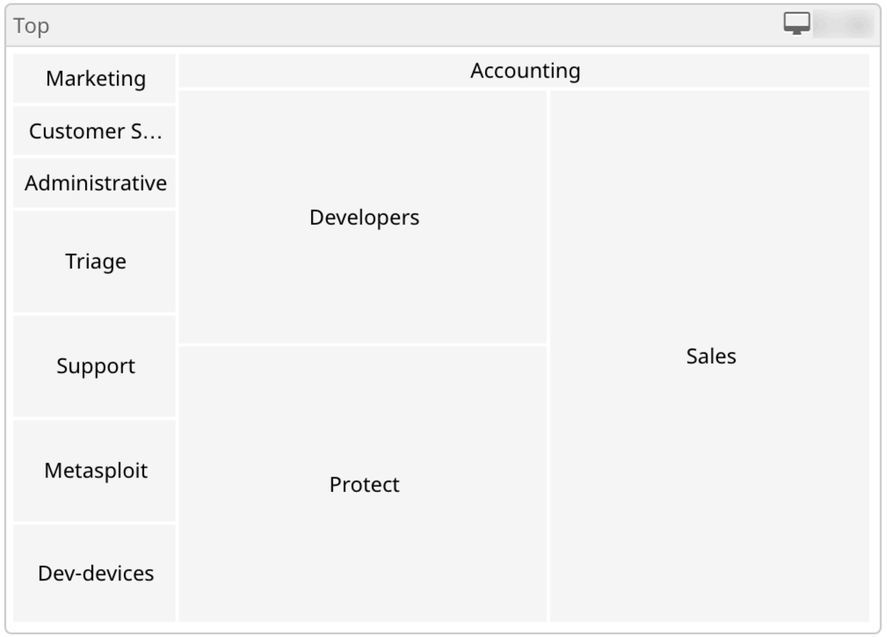
Cognitive Threat Analytics

unresolved threats
0

Compromises

Inbox

Top

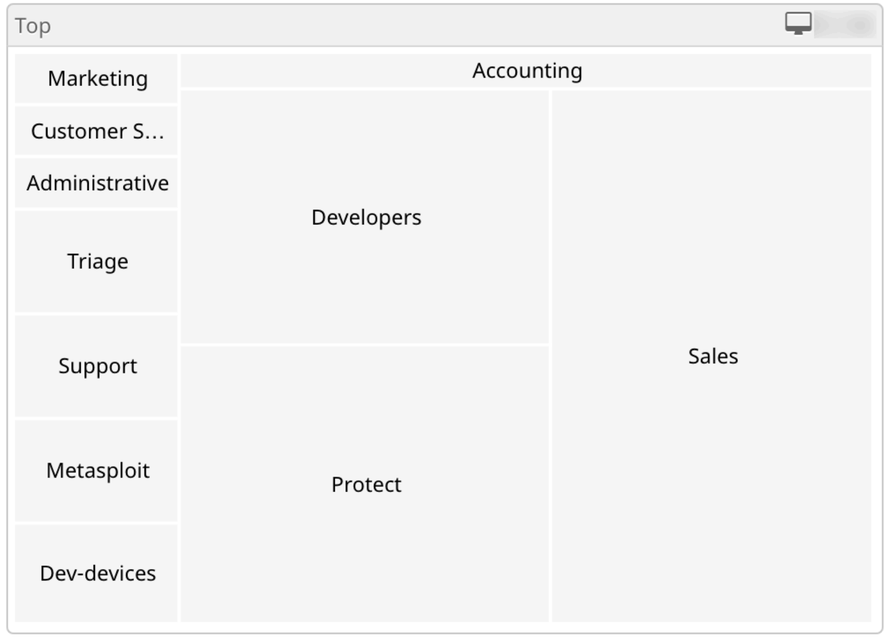


20 21 22 23 24 25 26 27 28 29 30 1 2 3 4
NOV DEC

Quarantined Detections

Quarantine Events

Top



20 21 22 23 24 25 26 27 28 29 30 1 2 3 4
NOV DEC

Vulnerabilities

View

Top

Threat Grid Analysis

0 Automatic Analysis Submissions
0 Retroactive Threat Detections

Statistics

2.26 Million Files Scanned
40.2 Thousand Network Connections Logged

Connectors

Example 3 - Controlling Internal Use

Trends

- Good security with less impedance
  - Hardware MFA (e.g. YubiKey) and/or biometrics (e.g. TouchID)
  - GCP Identity Aware Proxy as a potential alternative to VPN

- New techniques become available every 6 months or so
  - Keep up with the news
  - Evaluate techniques as they emerge and are adopted
  - If something works, implement it fast

Thank You

Questions?

Thank you to the photoghraphers who made their work available under permissive licenses for uses like this presentation

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