

Welcome to the Webinar!

SECURITY
BOULEVARD

How I Achieved Security Discipline and Governance Across AWS, Azure, and GCP

Jack Roehrig
CISO



Meet Our Expert Panel



Moderator

Charlene O'Hanlon

**Managing Editor
Security Boulevard**



Jack Roehrig

**CISO
Turnitin**



Patrick Pushor

**Technical Evangelist
Orca Security**

About Orca Security



Orca gives you workload-level visibility across 100% of your AWS, Azure, and GCP assets without agents.

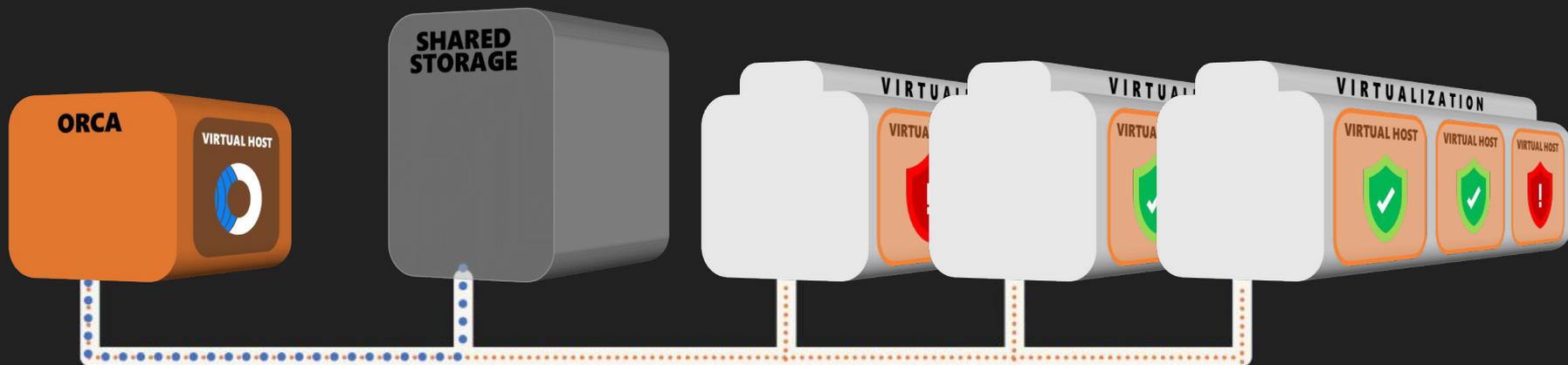
Instant-on, no hassle, impact-free deployment

Complete coverage, no overlooked assets

Deeper inspection, down to the data layer

Reduces thousands of security alerts to the critical few that matter

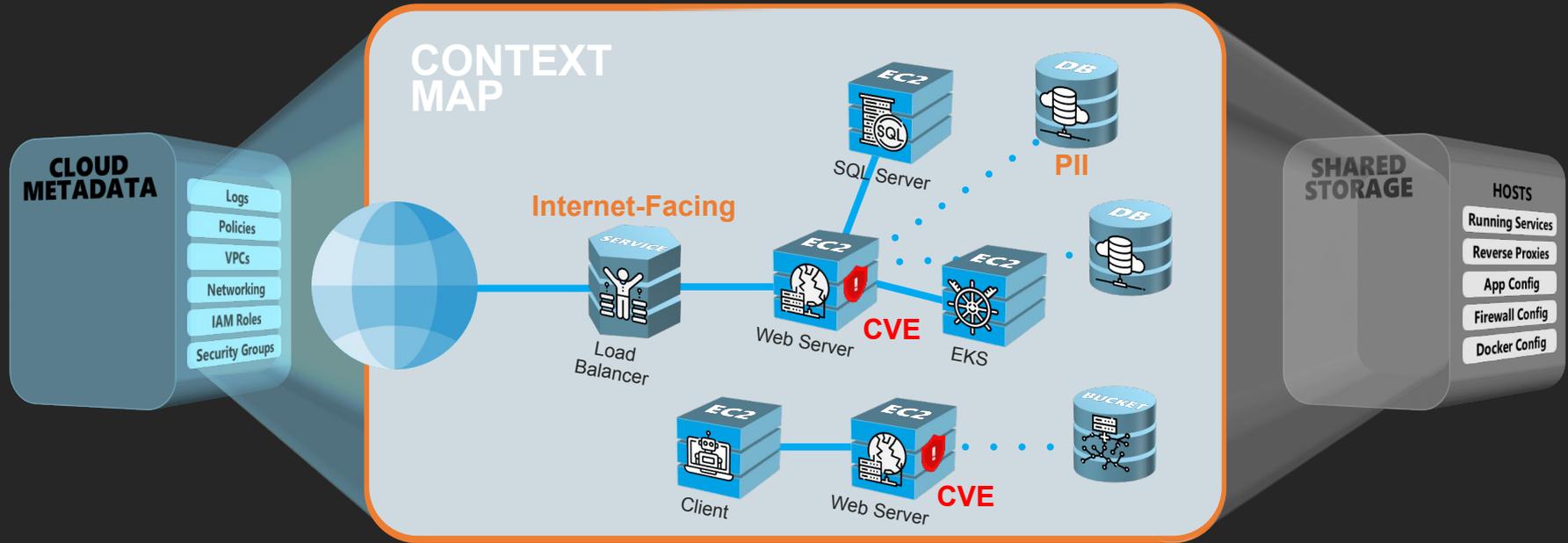
SideScanning™ Technology



All hosts are continuously
analyzed and protected

No Agent needed!

Understanding Context



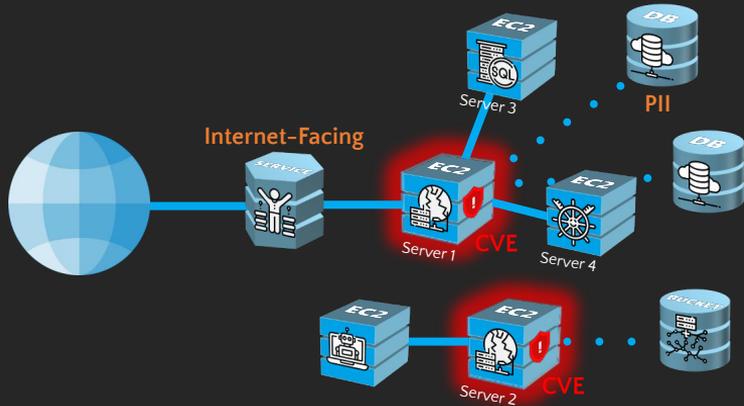
● Discover Cloud assets

● Identify asset roles

● Identify connectivity

● Identify Vulnerabilities

Understanding Context

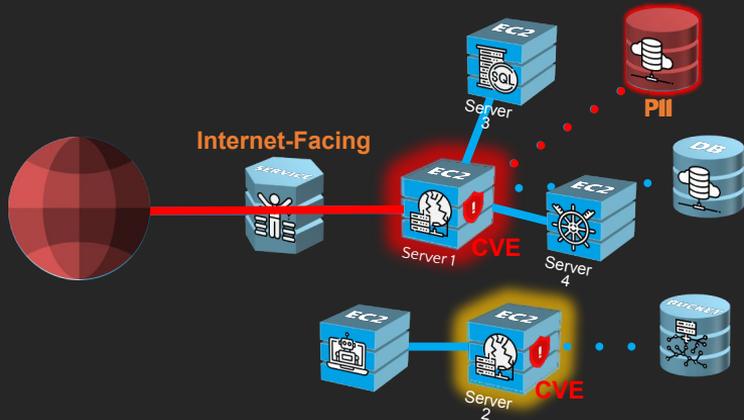


AGENTS LOG

	Asset	Service	Issue	Type	Score
!	Server 1	Apache	CVE-2018-1176	RCE	High 8.8
!	Server 2	Apache	CVE-2018-1176	RCE	High 8.8
✓	Server 3	SQL	--	--	None
✓	Server 4	EKS	--	--	None

Identical Severity Score

Understanding Context



ORCA LOG

	Asset	Service	Issue	Risk	Score
🚨	Server 1	Apache	CVE-2018-1176	Internet-facing PII Exposure	Imminent
⚠️	Server 2	Apache	CVE-2018-1176	Internal server	Medium
✅	Server 3	SQL	--	--	None
✅	Server 4	EKS	--	--	None

Severity Score according to context

Sample Customers



Enterprise

Top 10 Global
Consultancy

Top 5 Private
Equity Firm

Big 4 Professional
Sports League

Top 5 Global
Hotel Chain

Mid-Market

fiverr[®]

LIONBRIDGE

 **AROUNDTOWN**^{SA}

turnitin

 **MRS**

Cloud

people.ai

NG  **DATA**

Qu  **bole**

 **SISENSE**

 **Fyber**

Fintech


LIVE OAK BANK


North American[®]
BANCARD


paidy

cake

Rapyd

Type of Scanner / Capabilities

Agents

Unauthenticated Network Scanner

Authenticated Scanner

Cloud Security Posture Manager



Type of Scanner / Capabilities	Agents	Unauthenticated Network Scanner	Authenticated Scanner	Cloud Security Posture Manager	ORCA security
Risk to Scanned Assets	MEDIUM	HIGH	MEDIUM	NONE	NONE
Security Visibility Depth	HIGH	LOW	HIGH	LOW	HIGH
Security Visibility Breadth	LOW	MODERATE	LOW	HIGH	HIGH
Vulnerability Detection	YES	MODERATE	YES	NO	YES
Malware Detection	YES	NO	NO	NO	YES
INFRA, OS, Apps, & Data Inventory	YES	NO	NO	NO	YES
Cloud Level Misconfiguration Detection	NO	NO	NO	YES	YES
Scan Stopped Machines	NO	NO	NO	N/A	YES

“Tenable and Qualys both felt like they loosely bolted their legacy enterprise products onto the cloud. That doesn’t work well because you still have to deal with agents and contend with technology that isn’t meant for serverless or containers.”

Jeremy Turner

Senior Cloud Security Engineer





Hi, I'm Jack!

Beauty-school dropout

Over 25 years of InfoSec and DevOps experience

'Greenfielded' InfoSec programs for over a dozen companies

Dual DevOps/Security roles

Data privacy nerd

Passion for ethical impact



Hi, I'm Jack!

Global CISO experience in:

- Education
- Healthcare
- Advertising
- Social networking
- Search
- SaaS
- B2B
- Media

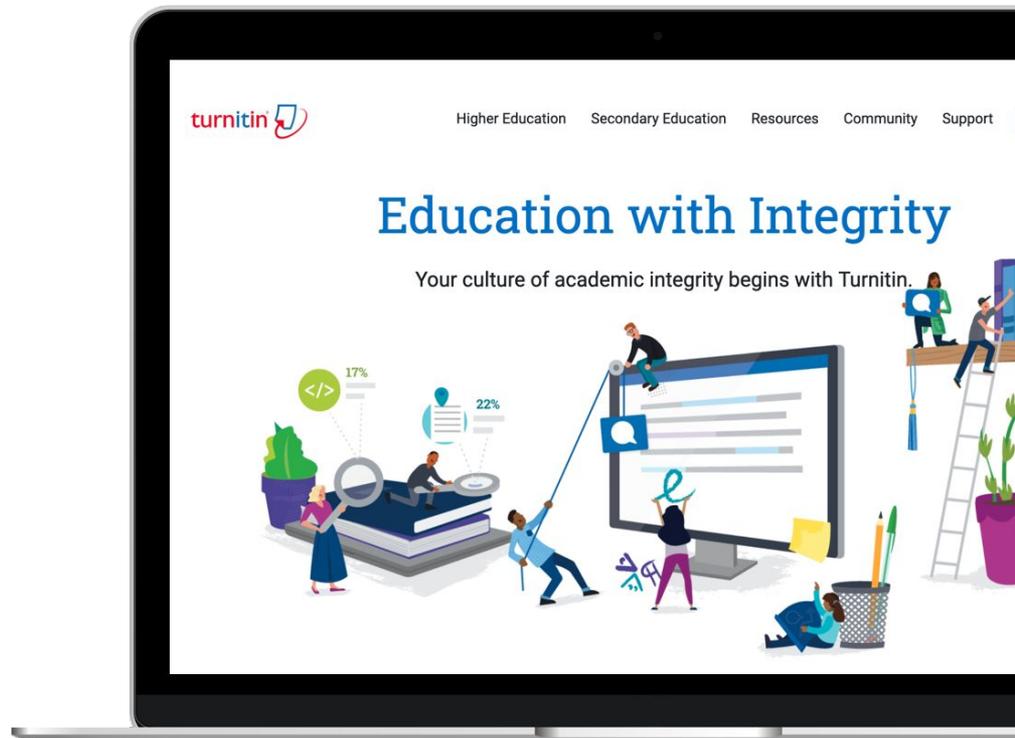
About Turnitin

Among many other things, we focus on similarity (plagiarism) detection

Huge database of free-form submissions

Not just essays!

- Index the internet like Google
- Store licensed content
- Corporate customers
- Government customers



About Turnitin

≈ 1.3 BILLION submissions!

Tens of millions of users in over 150 countries

Paid SaaS solution. No advertisers

Turnitin needs strong security and data privacy practices



State of data privacy and security in education

Academic institutions continue to be targeted by hackers.

- Large infrastructure deployments (more attack space).
- Understaffed and can't afford enterprise security programs.
- High-bandwidth internet connections.
- Can't prioritize keeping software up-to-date.
- Students tend to abuse shared infrastructure.

All of these characteristics make institutions a prime target for hackers to build infrastructure, extort money, and steal sensitive data. Some just want to disrupt!

Security Challenges at Turnitin

2017

Greenfield security program began just under three years ago

2019

Pivoted from four-year private-equity-backed firm to indefinite-term variable-runway. **Huge change in risk appetite!**

2020

Tricky cloud migration requiring user adoption
launching now



Security Challenges at Turnitin

Customers are passionate about data privacy

Unique target: misunderstood, often-hated, and a honeypot of data

Complex, delicate infrastructure. Difficult to maintain; compromised governance and SoD



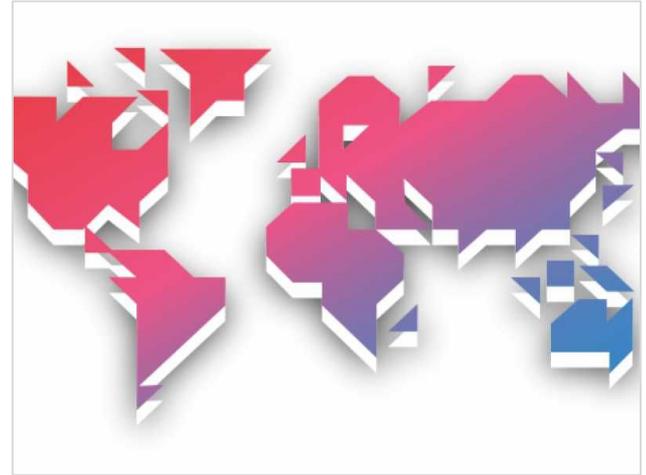
Security Solutions at Turnitin

Holistic program in-place: soft solutions prioritized with technical solutions

Security culture: everyone thinks about security in their own roles

Security from day one: every employee receives personal onboarding from Jack

Risk-based approach: emphasis on discovery and prioritization of issues



Cloud Security Solutions at Turnitin

Cloud Migration Needs

Complicated, lift-and-shift cloud environment

Needed fast awareness of risks in production for go/no-go development

Cloud Security and Governance Stack

Orca Security

Host-based IDS

Whitesource for our CI/CD pipeline

Various tools and services to audit application security

Configuration management for patch deployment (to fix what Orca finds)

Cloud Security Solutions at Turnitin



Orca Security enables us to..

- Identify risks in ungoverned cloud accounts
- Identify misuse of PII/personal data on production infrastructure
- Satisfy various compliance requirements
- Routinely govern bad employee behavior (PII storage, key storage, password storage, etc.)
- Enforce sane credential use
- Discover assets across multiple cloud service providers and many accounts
- Profile the risk of potential acquisitions (M&A due diligence)

How Orca Security Empowers Turnitin

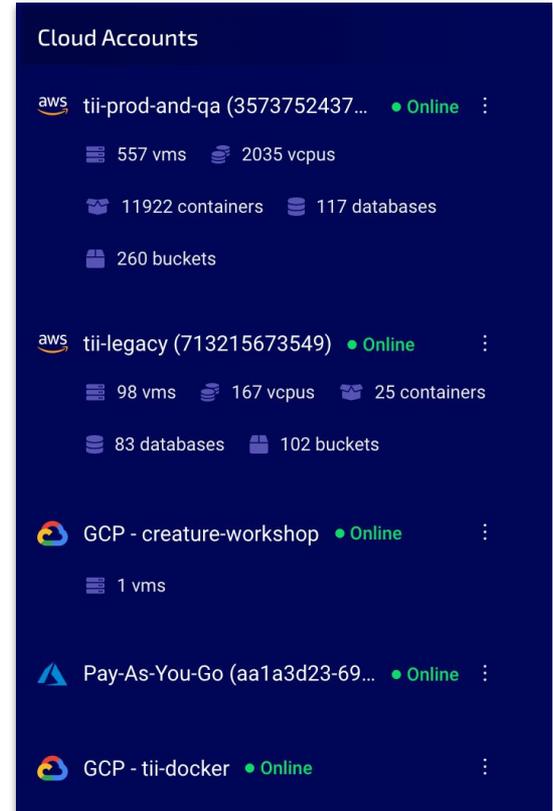
It's agentless. The skeletons are always in the closets I can't open.

Installs quickly, profiles risk immediately

Profiles machines regardless of my access

Eliminates friction with DevOps

Enables easy management of many cloud accounts



How Orca Security Empowers Turnitin

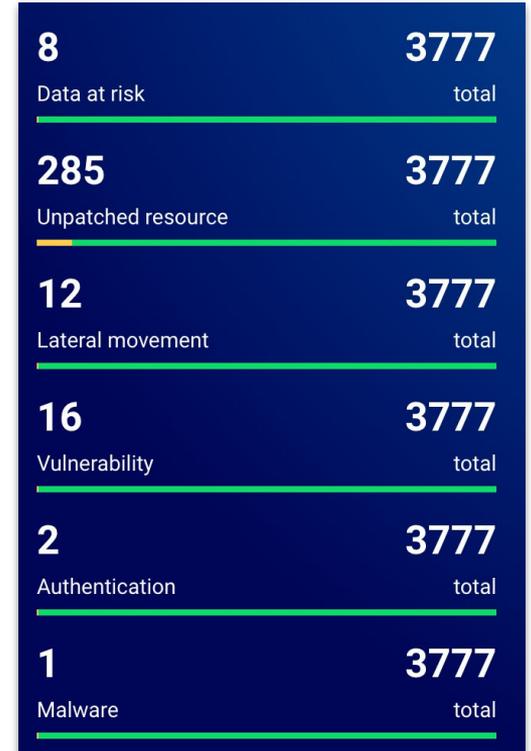
It aggregates risk so I don't have to.



Easy-to-consume risk categories

Aggressive data granularization

Enables pragmatic risk consumption



How Orca Security Empowers Turnitin

It identifies improperly-handled PII, which can illuminate data segregation risks.

Discovers PII where it shouldn't exist

Enables insight into who is managing sensitive data

Empowers governance of data segregation policies



Personally Identifying Information – accounts

Email addresses found on an internet-facing asset

Modification time: 2020-06-05 06:21:25

File: /var/pd/tests/INTS-5651/accounts_to_deconfigure.csv

Email addresses (Masked):

- ka*****@bcc.cuny.edu
- wj*****@kings.edu
- dc*****@westmont.edu
- ms*****@wlu.ca
- ir*****@taism.edu.om
- tt*****@athabascau.ca
- t.*****@kingston.ac.uk
- nj*****@gateway.ac.uk
- tr*****@ubalt.edu
- rt*****@britishschool.be

How Orca Security Empowers Turnitin

It helps me govern the goofy things that people do.

Description: the private key "/home/jmiller/.s

Private key file: /home/jmiller/.ssh/id_rsa

Public keys:

- /home/jmiller/.ssh/authorized_keys (cas
- /home/jmiller/.ssh/authorized_keys (ops
- /home/jmiller/.ssh/authorized_keys (cas
- /home/jmiller/.ssh/authorized_keys (cas
- /home/jmiller/.ssh/authorized_keys (cas
- /home/jmiller/.ssh/authorized_keys (ops
- /home/jmiller/.ssh/authorized_keys (db-
- /home/jmiller/.ssh/authorized_keys (cas
- /home/jmiller/.ssh/authorized_keys (ops
- /home/jmiller/.ssh/authorized_keys (cas
- /home/jmiller/.ssh/authorized_keys (cas
- /home/jmiller/.ssh/authorized_keys (cas

Enumerates lateral movement from stored private keys

Snitches on the lazy bash users

Makes employees think (know) that I'm omniscient

Password in shell history

The asset contains credentials in shell history, found in clear text.

How Orca Security Empowers Turnitin

It highlights risks of potential acquisitions without being invasive.

Acquisitions tend to be mostly in the cloud

Orca integrates quickly into cloud accounts

Orca aggregates risk at a high-level

Orca creates executive-level reporting in seconds



How Orca Security Empowers Turnitin

It alerts me of new risks in ungoverned cloud accounts.

Watches over hundreds of clouds

Categorizes new risks and alerts me about them

Illuminates the chaos; enables practical visibility

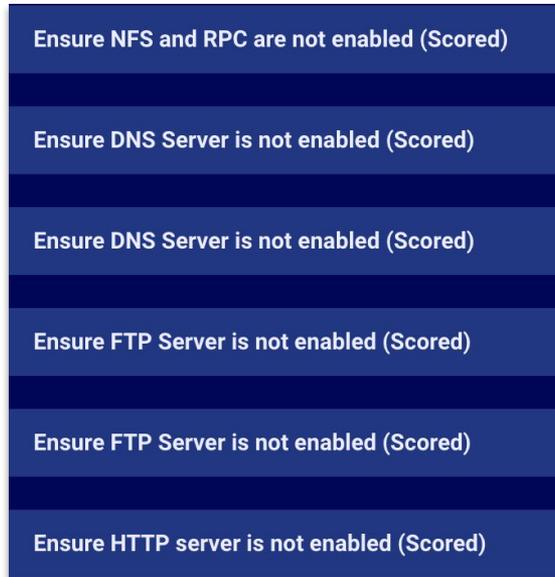
 orca-23163	Unpatched Host OS
 cacenp-sato-dpr-process Running	We have found 520 vulnerabilities

- AWS - 357375243774
- AWS - 713215673549
- Azure - db89e8d97561-941efd1d9d51
- GCP - ai-sales-training-jan-2019
- GCP - alteryx-connector-230416
- GCP - archive-11b93
- GCP - banded-meridian-257501
- GCP - blog-1569561133494
- GCP - bonsai-demo



How Orca Security Empowers Turnitin

It provides evidence to my auditors.



Watches over hundreds of clouds

Categorizes new risks and alerts me about them

Illuminates the chaos; enables practical visibility



How Orca Security Helps Reduce Friction with DevOps

My DevOps Engineers...

- Were skeptical
- Hate agents
- Loved the quick deployment
- Like the simple UI and easy-to-consume risks, but hate being outed for insecure practices
- Eager to enable DevOps governance



How Orca Security Helps Reduce Friction with DevOps

The Shift-Left Security Approach

Shift-left isn't just about guardrails, controls, and policies: it's culture

- At the core of every holistic security program is motivating a culture of security
- Omnipresent tools (like Orca) that highlight poor security in real-time help shift culture
- Tools that drown out useful data with noise are ineffective

Orca Security aggregates the risk and eliminates the noise

- One of my first initiatives at Turnitin was to eliminate false-positive alerts
- Our on-call and support engineers couldn't prioritize the chaos
- Orca's risk-aggregation and risk-correlation solution eliminate the noise
- This allows engineers to focus on what's important



What, No SIEM?

Alert fatigue and the ubiquitous SIEM...

Mature company problems - SIEMs are ineffective

- I was once quoted \$6MM for a SIEM from Splunk
- I managed infrastructure that produced tens of terabytes of relevant logs a day
- I had a team of \approx 40 employees across six departments
- **Who has time for all that data ingestion, aggregation, and routing?!**

Modern tools prioritize risks & reduce SIEM insanity

- Several tools in our stack do this well
- These tools store informational/trivial logs in their own systems, for limited time
- Higher-severity and higher-priority logs are pumped to Slack (free, long-lived, auditable)
- Critical-severity logs are sent to alerting infrastructure for business-hours or after-hours response

Tips from the Field - Full Scope Governance

Governed assets introduce less risk than ungoverned. Because they're governed...

- It's a catch-22
- DevOps engineers spend too much time in the wild west; lassoing rogue assets and herding "pets"
- Infrastructure are cattle, not pets...

Full-scope governance - from stochasm to determinism

- Some tools work on discovered assets - unknown gap
- Some tools discover assets - known gap that needs to be closed
- Some tools govern the assets they discover - closed gap

Nothing is perfect, but I work with risk, not absolutes

- Unknown gaps make understanding risks difficult
- Known gaps make understanding risks much easier
- Auto-governed, auto-discovered gaps mitigate risk

Tips from the Field - SoD and a Kitchen Full of Cooks

More mature-company problems

- Mature companies have many orphaned products and features
- These generally require hands-on support directly from engineers; they lack operational governance

Even more mature-company problems

- Mature companies have a smaller appetite for risk and a bellies full of sensitive data
- Least-privilege is essential for managing sensitive data; especially when there are “too many cooks”

Mature-company solutions

- Effective PII/personal-data discovery assists with enforcement of SoD and least-privilege
- When guardrails aren't feasible, throwing up roadblocks will mitigate risks effectively
- Roadblocks enforce policy and satisfy audit

Tips from the Field - Minimizing Duplicative PII/PD

Malicious actors tend to be lazy; lazy in a good way

- Why break into Fort Knox when the janitor has a big batch of bullion in his bunk?
- Duplicative personal data stored outside of regulated areas is a honeypot for bad bees

Why is personal data stored duplicatively?

- Well-intentioned contributors unknowingly violate SoD for testing, migrations, or manual work
- And they rarely clean up their messes

Mature-company solutions

- Monitoring for and destruction of rogue personal data eliminates attack vectors
- Tools like Orca Security monitor this in real-time, with full-scope governance
- DevOps can target, and destroy



Tips from the Field - Lateral (diagonal?) Breach

Once a perimeter is broken, lateral breach tends to be much, much easier

- Everyone knows this
- Almost no one has an effective east-west ZTN with port-level granularity control. They do exist, though, and are bad-ass

Cross-cloud, cross-SaaS, breach

- In a ZTN world, lateral breach has new meaning
- Using different techniques, a breach into one asset makes breaching other zero-trust assets easier

Mature-company solutions

- Monitor for stored SaaS and cloud credentials in infrastructure assets
- Don't skimp on the SSO tax
- Enforce MFA on those cloud accounts



Tips from the Field - Improve Password Strength

10 character minimum, 1 of these (#!'^~--~\$Я), none of these (\$?*%), etc

- Neat
- Complex password or password complexity?

What is a weak password?

- One that I can guess. One that I can find in a hash table. One that has been breached
- I maintain my own breach database with over 25 billion rows

How are passwords discovered by hackers?

- Querying breach databases for unique user identifiers to see what passwords they've used
- Hashed password searches - finding similar users and correlating metadata to guess
- Breaching email accounts with known passwords and resetting unknown passwords
- Hash-table lookups
- Cracking - I assume is still a thing?

PRODUCT DEMO



Q&A

Don't forget to sign up for an Orca Demo
and Free Trial at <https://orca.security/demo>



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