Product Security Incident Response at a Fortune 500 SaaS

Garrett McNamara

You are in the right room

makeameme.org

Garrett McNamara

Former: dev, researcher, educator

NOW

- Sr. Product Security Response Manager, Founder of ServiceNow PSIRT
  - CNA
  - FIRST.org
- MBA student

BEFORE

- CNA x2; FIRST.org x1
- Okta
- Forcepoint PSIRT
- Gov contractors
- Invincea / Sophos
- Search and rescue volunteer (for fun)

Mostly hosted ← *Mostly on-prem*

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- PSIRTs since 2015*
  - *18-month break as an AppSec educator working with devs @ Okta
- Type 2 fun enthusiast
  - You all are too fun
  - Can't escape PSIRT
  - PSIRT is life

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Premise

💡 Product security incident response at a SaaS technology company comes with **challenges and opportunities different from those at a strictly on-prem vendor.**

✗ Challenges include easily discoverable and often wide-open Internet connected attack surface area.

✓ Opportunities include that rapid risk-based decision-making is enabled by the ability to measure exposure at scale and monitor for exploitation activity.

Agenda

YES ✓

- Risk factors
- Hosted vs on-prem
- Challenges (~70%)
- Opportunities (~30%)

NO ✗

- Advice
  - + I'm not a lawyer
  - + Views are my own
  - + Your needs may vary
  - + My advice is very bad

Risk Factors

- Speed of attack surface discovery on shared infrastructure

- Colocation / subdomains can mean easy enumeration
  - …and accidental overspray
  - Not suggesting you rely on obscurity!

Dave Dugal?

youtube.com

Risk Factors

- Fast researcher ramp up:
  - [Opinion] Web tech has a lower learning curve for researchers to find at least basic vulnerabilities
  - Accessible (i.e., free), instantly ready
  - Minimal hardware investment
- Easy target access:
  - Internet connected / no customer-controlled network isolation / less defense in depth
    - CVSS scores tend to start higher due to Attack Vector (AV) == Network
  - Ingress and egress requirements / can't interfere / shared infrastructure

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In other words…

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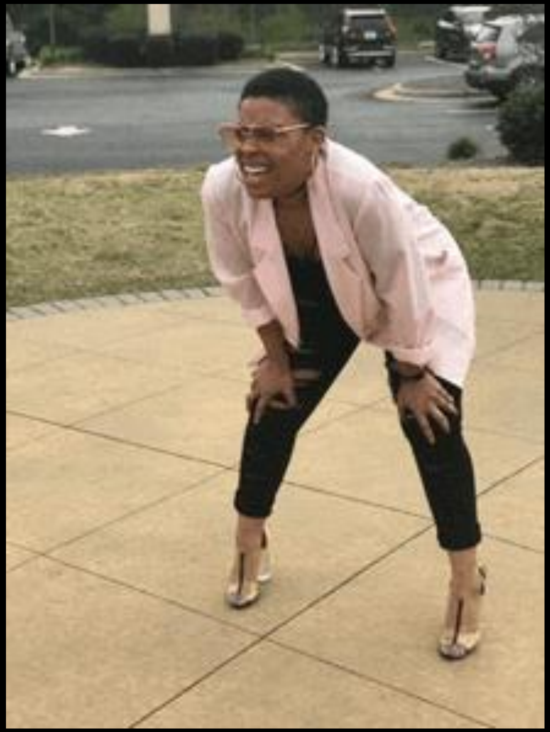
Cloud doesn't always mean hands off

Using a hosted / cloud vendor doesn’t necessarily remove all customer involvement:

- Shared responsibility model
- Customer risk decision making
  - Patch now or later
  - Apply mitigations
- Unclear expectations in time of crisis

Challenges - Visibility



Potential customer surprises after a vulnerability disclosure:

- Vendor may lack visibility **by design** into requests and responses (weighing privacy concerns).
- Vendor therefore cannot advise on whether a data leak occurred.

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Challenges - Mitigations

- Mitigations (WAF) can break functionality for all or even just some customers
  - Some customers would rather endure some downtime than data leak
  - How much downtime until permanent remediation
- Rate limiting can vary by use case
  - Power users use cases may break (bulk downloads / rapid API calls)
- Hosted providers do not have unlimited capacity against DoS

- Malicious traffic doesn't always look different

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Challenges – Disclosures

- CVEs for cloud if no action required?
  - If auto-patching enabled, was action required?
    - Customer enablement could still come in the form of manual patch adoption faster than scheduled

- How soon to publish?
  - Give customers time to patch before full CVE details released; but
  - Some do not act unless vulnerability management tooling flags for a CVE
  - Bonus: do any customers expect warning before others?

- At thousands of customers (each having 1 or more staff), embargo is complex

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Challenges – Intentions

Did the customer intend to do that?

- Do they *mean* to have that set up?
- Do they *know* they have that set up?
  - Did someone ten years ago who later quit set it up?
- Have people built on top of the convenient problem without knowing it?
  - *It just works*

Challenges – Intentions, part 2

- Breaking changes
  - Three ring model:
    - (Vendor) Platform behavior (PaaS)
    - (Vendor) Re-use of that behavior to make apps (SaaS)
    - (Customer or partner) Also using that behavior (custom code)
  - Which means, multiple dev audiences to educate
- Signature mismatch on modified files / too dangerous to touch?
- Arbitrate abuse of other Internet services
  - Don’t want your shared infra to be banned

Challenges - Enablement

Shipped secure, but option to reduce that still lands vendor in the news.

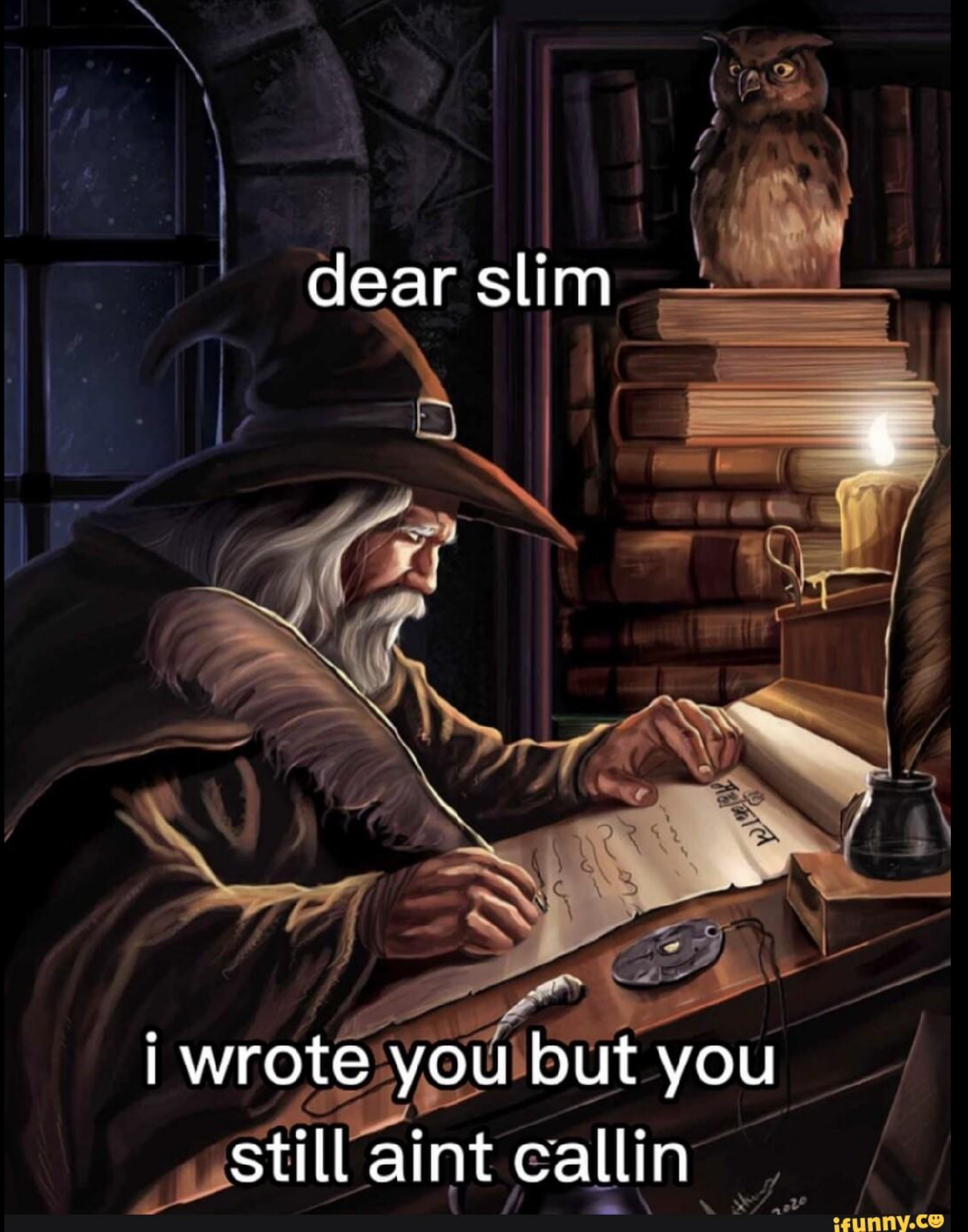
No win situation.

Yes, responsibility on customer but it’s a dead right situation in the court of public opinion.

Challenges - Comms

Comms failures

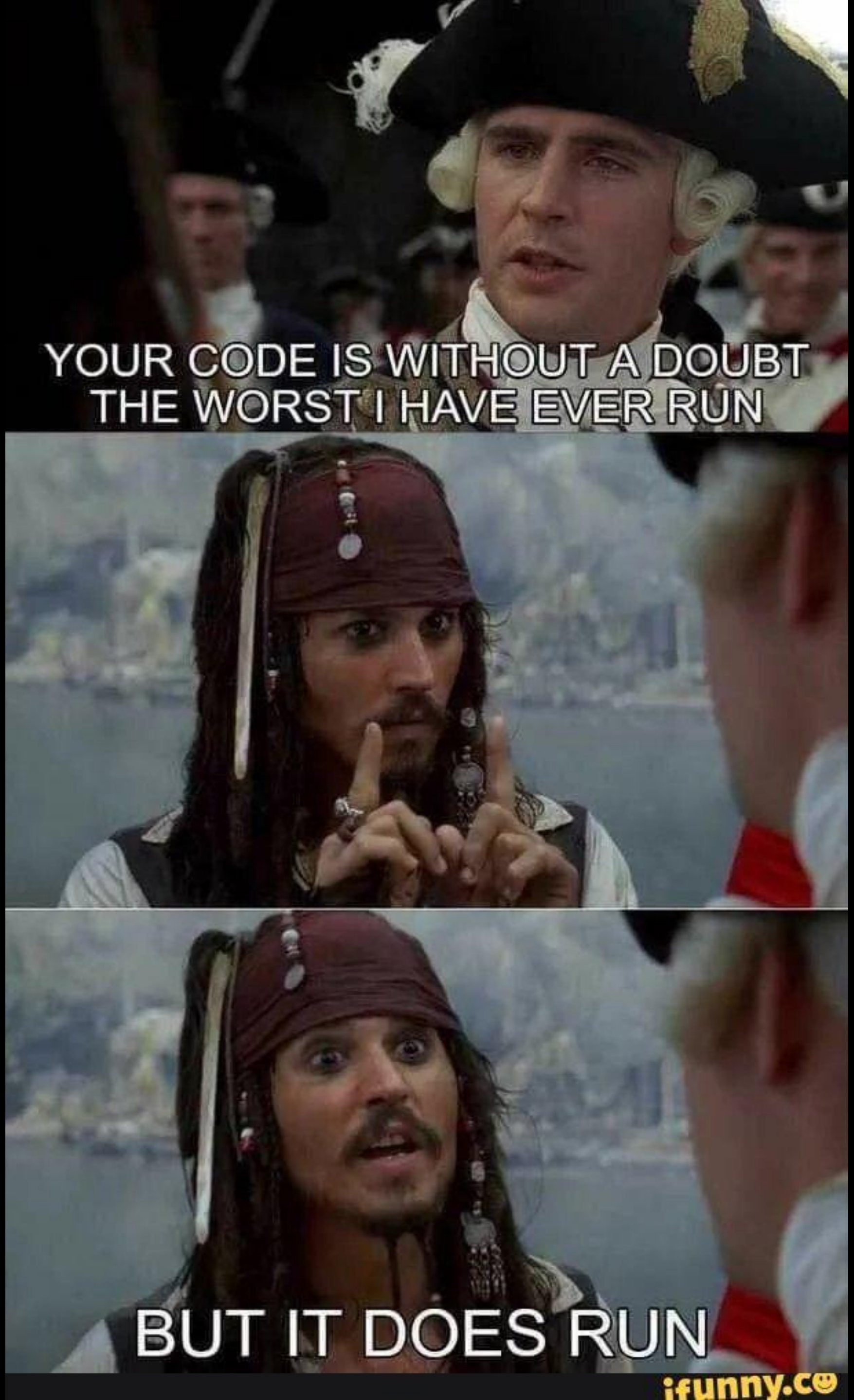
- Expired customer security contact info
- PTOs without coverage
- Security and maintenance and consumer teams may be different
- Relay failures with managed providers



Challenges - Features

Living Off the Land (LOTL)

- At vendor expense especially if the software has powerful features. These can include the abuse of other services.
- Even if not malicious, just poorly written custom code.



Challenges – Maintenance

- More stuff! Hosted providers are responsible for addressing vulnerabilities in the entire software stack
- But wait… even a small percentage of on-prem business means the product (and its security patches) are still subject to reverse engineering
  - Tactically acquired

The product
Everything supporting the product

istockphoto.com

Challenges – Steering

- Block ability for rollbacks in underlying platform software.
- Revoke vulnerable versions from app store.
- Soak time for testing changes- how much to allow? May have customers who only want to update yearly. Researcher wants shorter timeline- e.g., 90 days.

ricesigns.com

Opportunities – Hosting's not all bad?

- Honeypot gathering opportunity. Even if it's infrastructure that wasn’t meant to be a honeypot.
- Get a data set for sale and realize it's junk. Judgement call:
  - + Do you buy it? Do you report out that it's junk demo data? Does it matter?
  - + Ensure even demo environments are patched with same urgency as real environments

Opportunities – Observing

- Being sane about what to escalate to accelerate remediation SLA
- Observed testing activity in common across customers = suspicious = blocking
  + Watching for proof-of-concept maturity evolution
- Ability to measure true exposure quickly:
  + Versions adopted
    - ▪ Component adoption
  + Relevant configurations
  + Prod vs subprod deployments
  + Quantity of data in use for xyz component
    - ▪ Some components come with demo data

Opportunities – Accelerating

Ability to force change or urgent comms, if needed

- Secured right away, but with downsides:
  - Disruptive to everyone
  - Establishing precedent overextending in the shared responsibility model
  - Difference in customer preference on breakage vs locking down.
    - Breaking may just change impact from Integrity and/or Confidentiality, to Availability.
    - Does breaking something count against uptime guarantee?

We talked about

PSIRT at a SaaS has challenges and opportunities different from those at a strictly on-prem vendor.

Thank you,

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