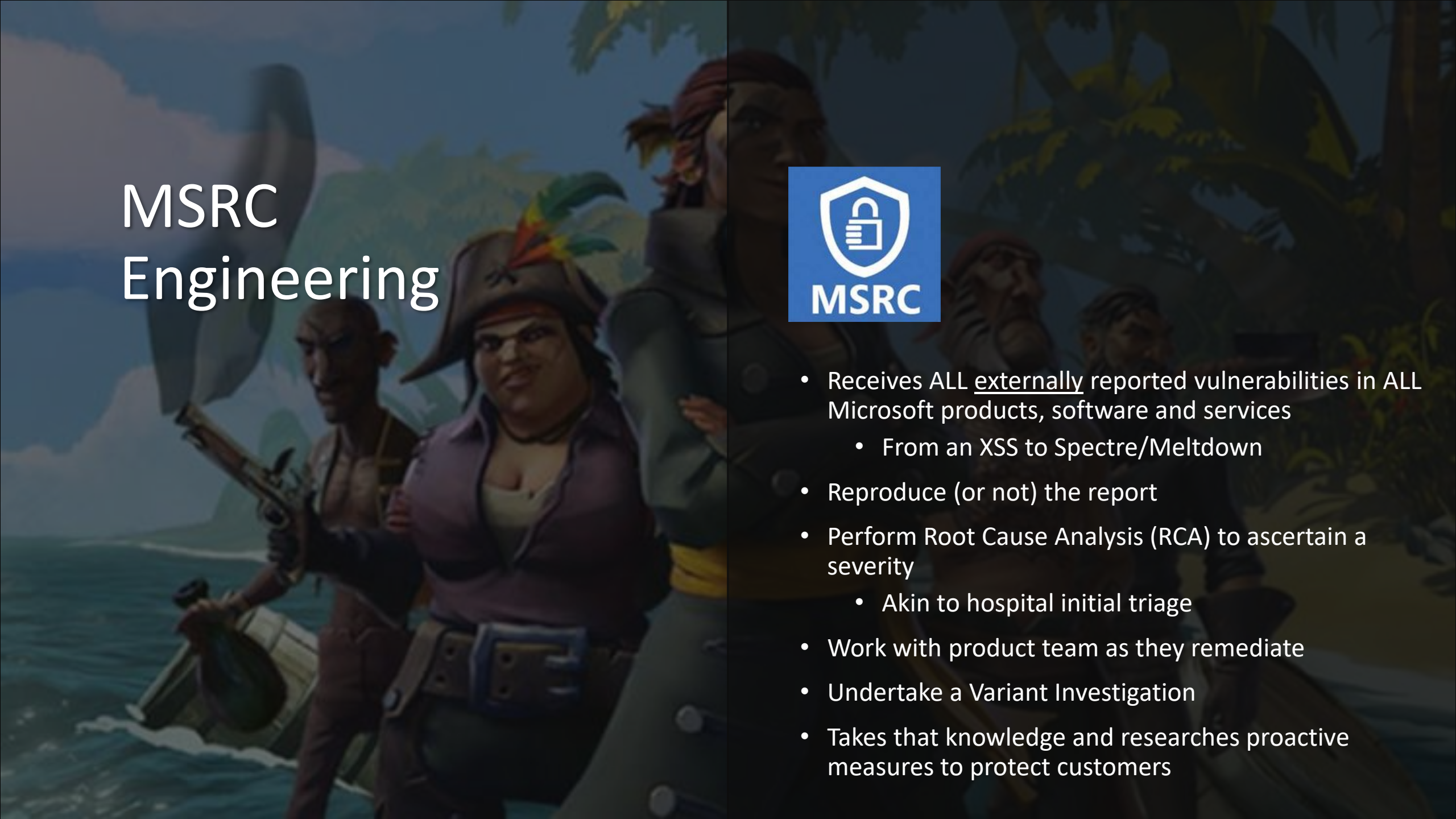
Stories from the

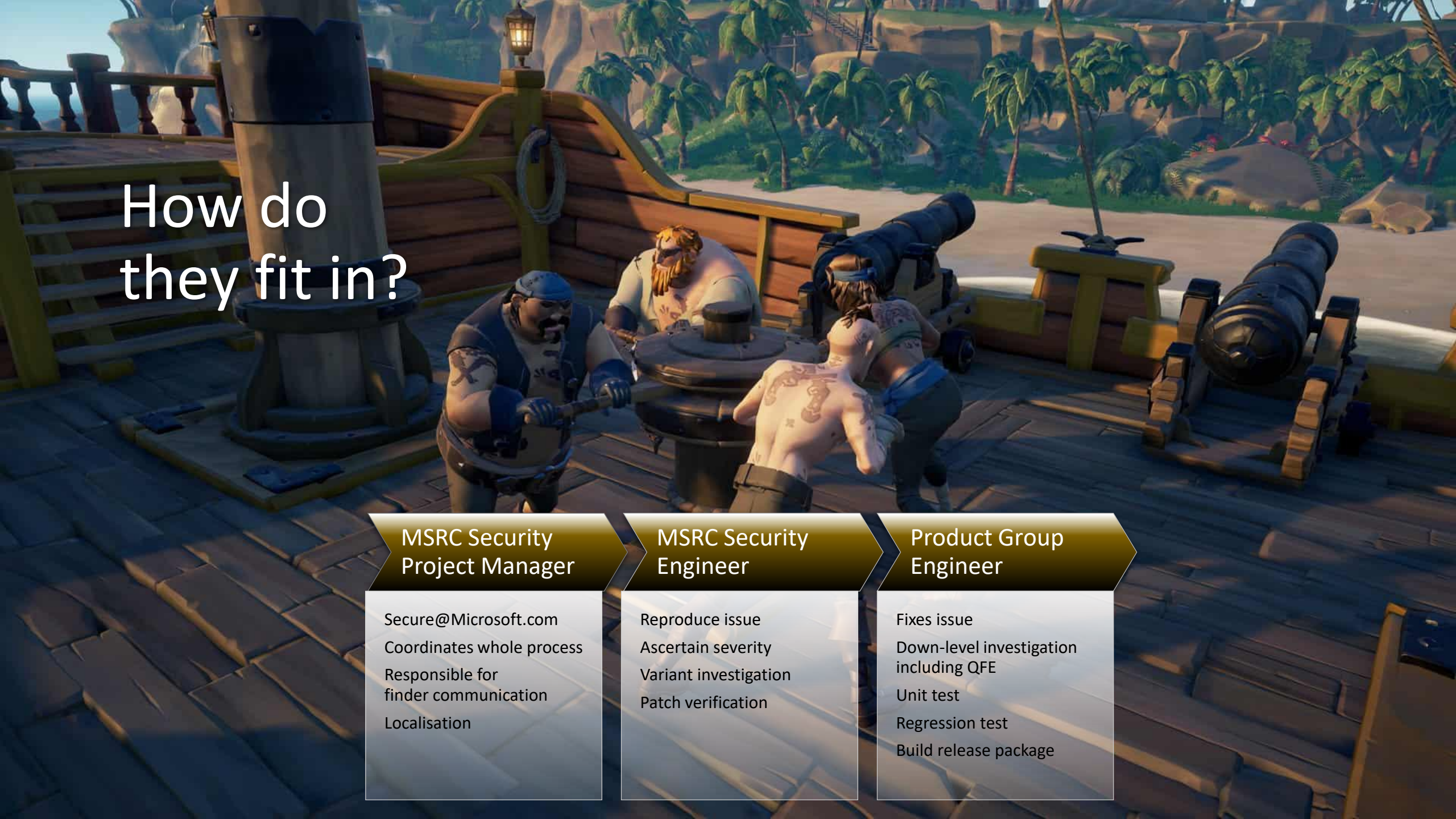
Cyber Battlefield & Protecting Customers

Microsoft Security Response Centre



MSRC Engineering

- Receives ALL externally reported vulnerabilities in ALL Microsoft products, software and services
  - From an XSS to Spectre/Meltdown
- Reproduce (or not) the report
- Perform Root Cause Analysis (RCA) to ascertain a severity
  - Akin to hospital initial triage
- Work with product team as they remediate
- Undertake a Variant Investigation
- Takes that knowledge and researches proactive measures to protect customers

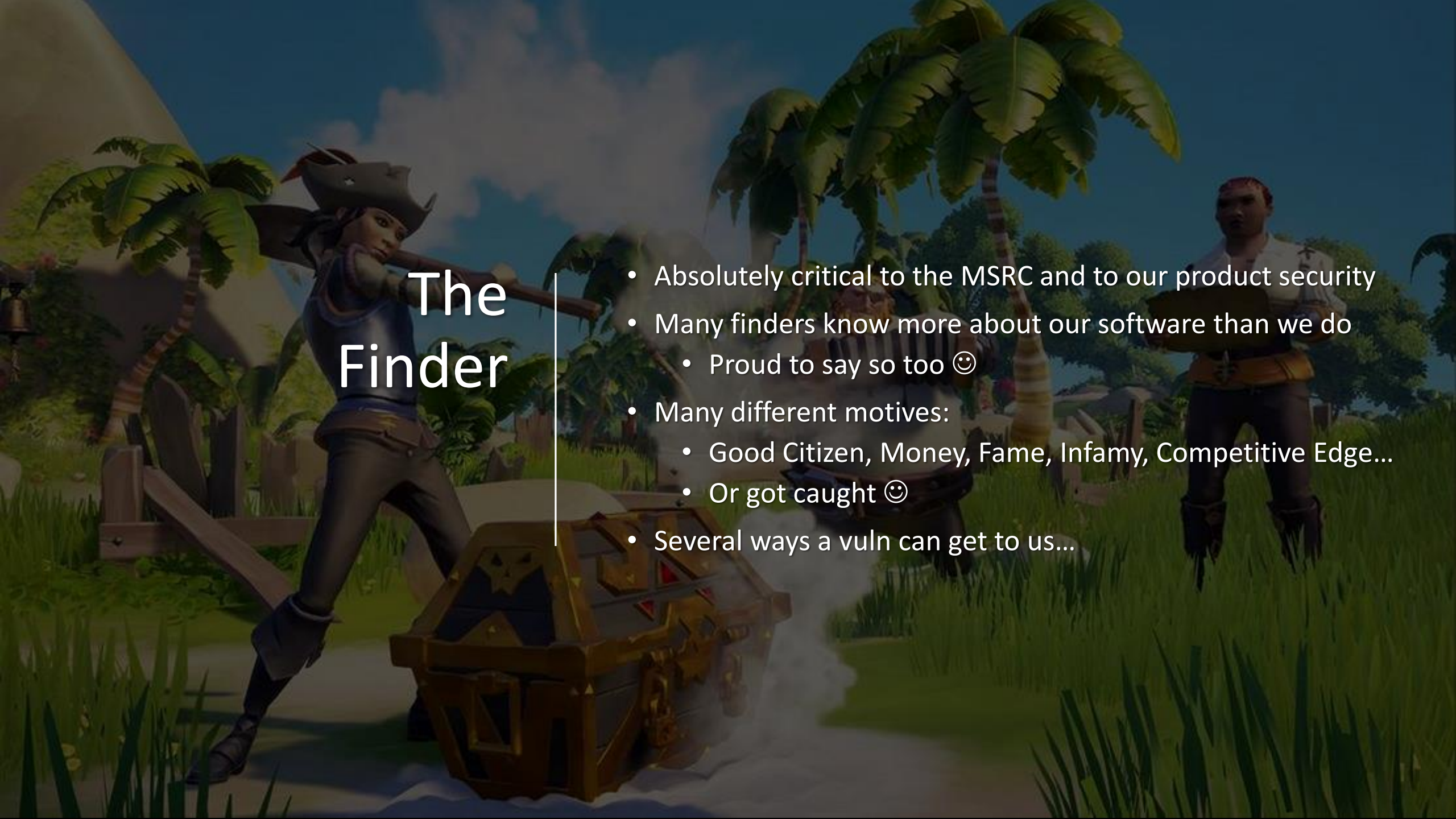


How do they fit in?

MSRC Security Project Manager	MSRC Security Engineer	Product Group Engineer
Secure@Microsoft.com	Reproduce issue	Fixes issue
Coordinates whole process	Ascertain severity	Down-level investigation including QFE
Responsible for finder communication	Variant investigation	Unit test
Localisation	Patch verification	Regression test
		Build release package

:~$ whoami

- Gavin.Thomas@Microsoft.com
- Protector of customers
- Principal Security Software Engineering Manager
- Joined the MSRC in 2006
- Leads the UK MSRC Vulnerabilities & Mitigations Engineering team
  - Based in Cheltenham town centre
  - Sister teams in US & Israel



The Finder

- Absolutely critical to the MSRC and to our product security
- Many finders know more about our software than we do
  - Proud to say so too ☺
- Many different motives:
  - Good Citizen, Money, Fame, Infamy, Competitive Edge…
  - Or got caught ☺
- Several ways a vuln can get to us…

How do Vulns get to Microsoft?

- Secure@Microsoft.com
- Receives 400+ emails a day (150,000 a year)

Report a Computer Security Vulnerability

The Microsoft Security Response Center investigates all reports of security vulnerabilities affecting Microsoft products and services. If you are a security researcher and believe you have found a Microsoft security vulnerability, we would like to work with you to investigate it.

Please note that the Microsoft Security Response Center does not provide technical support for Microsoft products. If you need assistance with something other than reporting a possible security vulnerability, please see the statement below that most closely matches your situation and expand the statement for next steps.

⊟ **Collapse All**

⊟ **I need to report a possible security vulnerability to Microsoft.**

If you are a security researcher and believe you have found a security vulnerability that meets the definition of a security vulnerability that is not resolved by the 10 Immutable Laws of Security, please send e-mail to us at secure@microsoft.com. To help us to better understand the nature and scope of the possible issue, please include as much of the below information as possible.

- Type of issue (buffer overflow, SQL injection, cross-site scripting, etc.)
- Product and version that contains the bug, or URL if for an online service
- Service packs, security updates, or other updates for the product you have installed
- Any special configuration required to reproduce the issue
- Step-by-step instructions to reproduce the issue on a fresh install
- Proof-of-concept or exploit code
- Impact of the issue, including how an attacker could exploit the issue

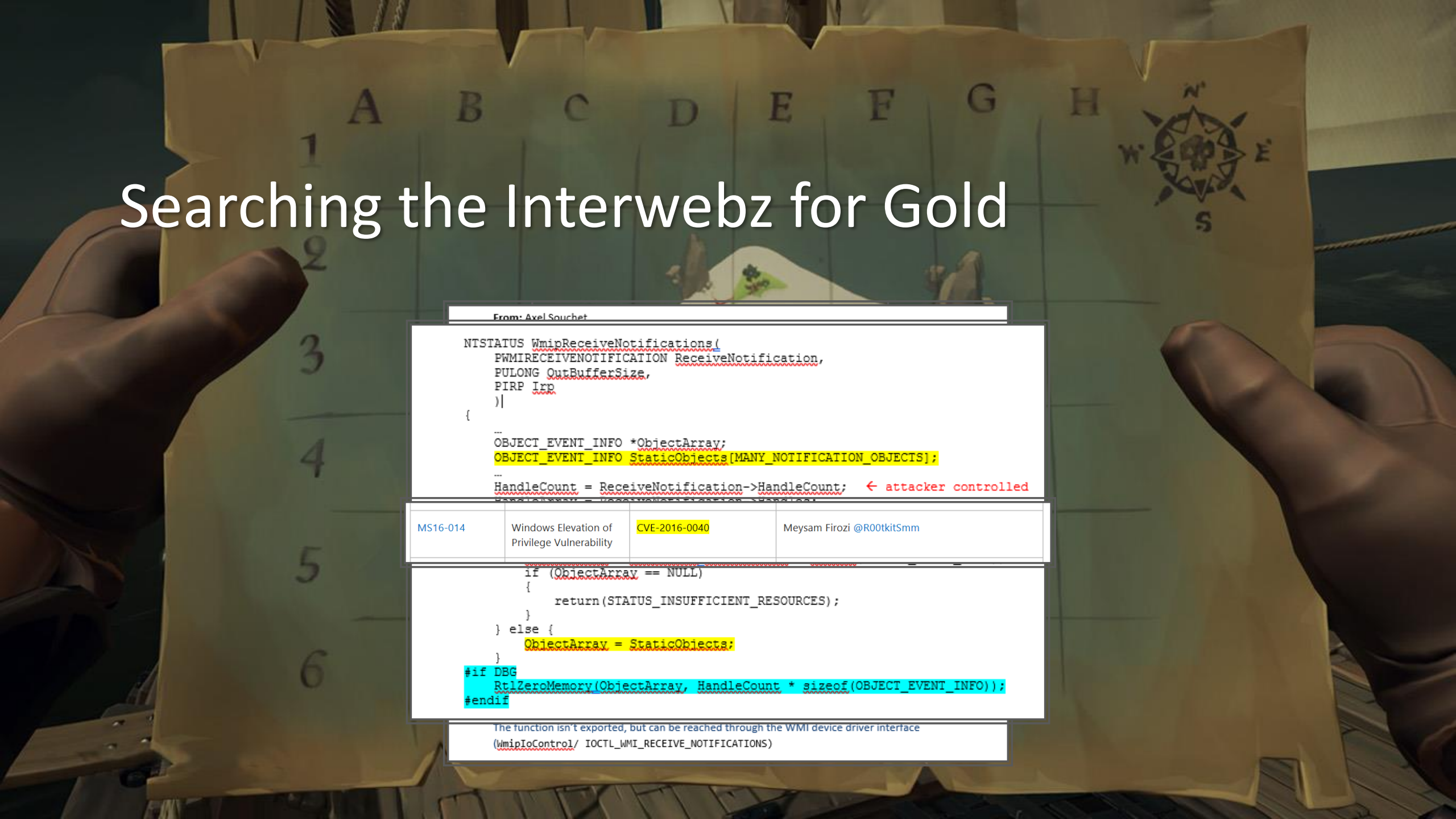
Microsoft follows Coordinated Vulnerability Disclosure (CVD) and, to protect the ecosystem, we request that those reporting to us do the same.

To encrypt your message to our PGP key, please download it from the Microsoft Security Response Center PGP Key.

You should receive a response within 24 hours. If for some reason you do not, please follow up with us to ensure we received your original message.

For further information, please visit the Microsoft Security Response Policy and Practices page and read the Acknowledgment Policy for Microsoft Security Bulletins.

Searching the Interwebz for Gold



Our MAPP Partners

Microsoft Active Protections Program

- Microsoft Active Protections Program (MAPP)
- MAPP partners have ears on the ground, can hear things we might miss
- Hunting for Zero-days and APT activity

Microsoft Threat Intelligence Center | Azure Security Center

Bounty Programmes

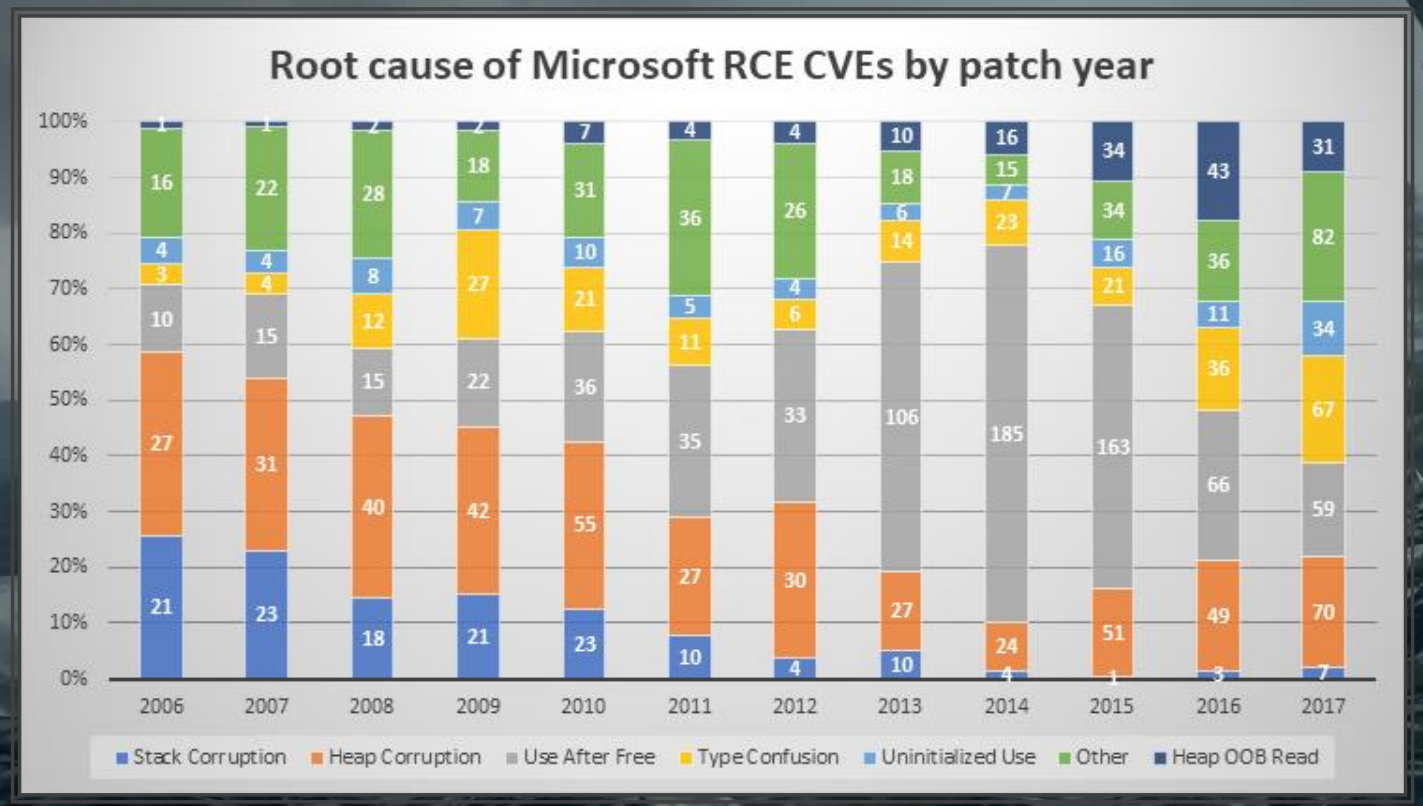
Program Name	Up to (USD):
Speculative Execution Side Channel Bounty	$250,000
Microsoft Hyper-V Bounty Program	$250,000
Bounty for Defence	$100,000*
Mitigation Bypass Bounty	$100,000
Windows Defender Application Guard	$30,000
Windows Insider Preview	$15,000
Microsoft Edge on Windows Insider Preview	$15,000
Microsoft Office Bounty Program	$15,000
Microsoft .NET Core and ASP.NET Core Bug Bounty Program	$15,000
Microsoft Cloud Bounty	$15,000

Vulnerabilities are Precious

- Paying for them via a bounty is great but:
  - Judication process can be tricky
  - Unpaid research…
  - Managing finder's is quite difficult!
- Can you remove a bounty?
  - We tried, odd results, backlash ☺
- Some (not all) bounties get significant 'hopeful' submissions
    - Unless you have automation that becomes very expensive quickly

We closely study Vulnerability Root Cause trends

Microsoft security engineers categorize the root cause of every vulnerability and look for patterns

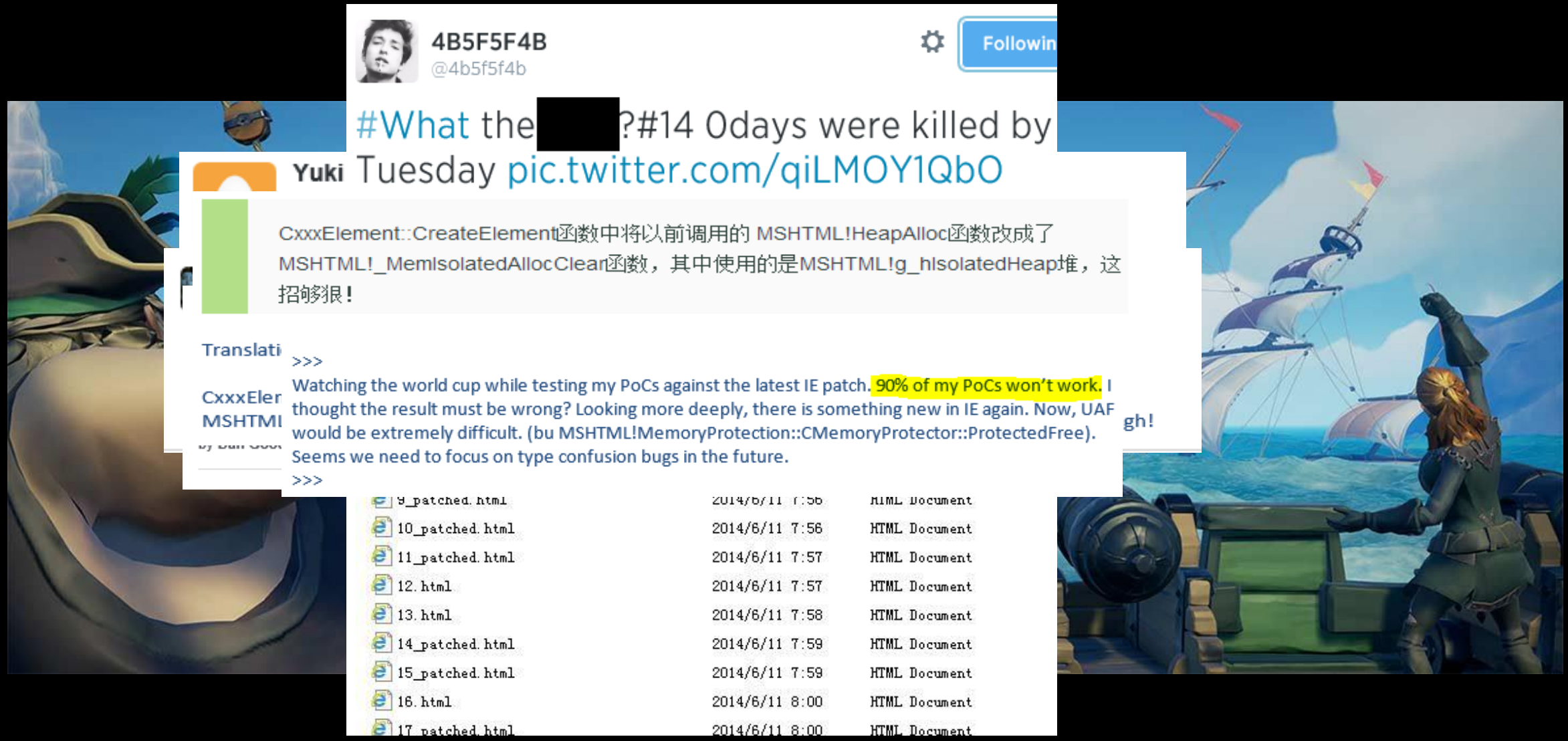


Stack Corruption:
Cookies and Static Analysis

Use After Free: memGC

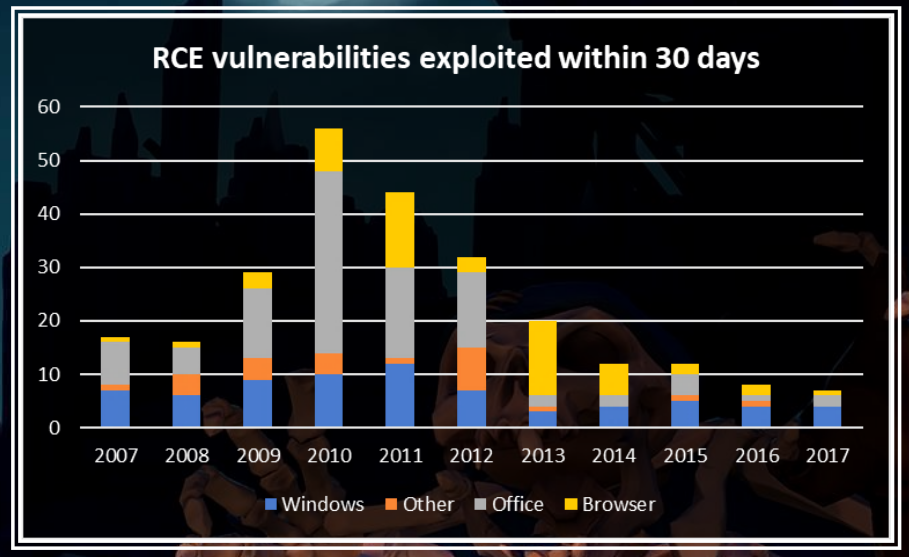
Type Confusion: TypeProtect

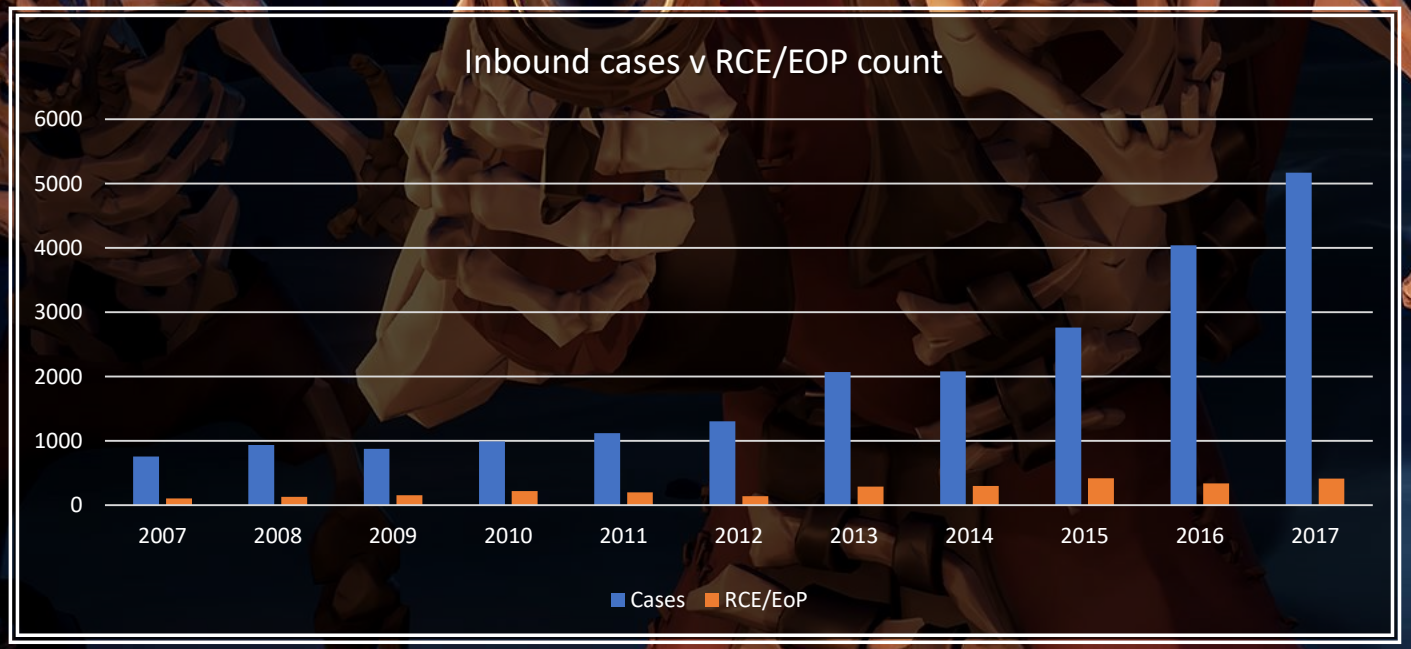
Sad Attackers = Happy Microsoft

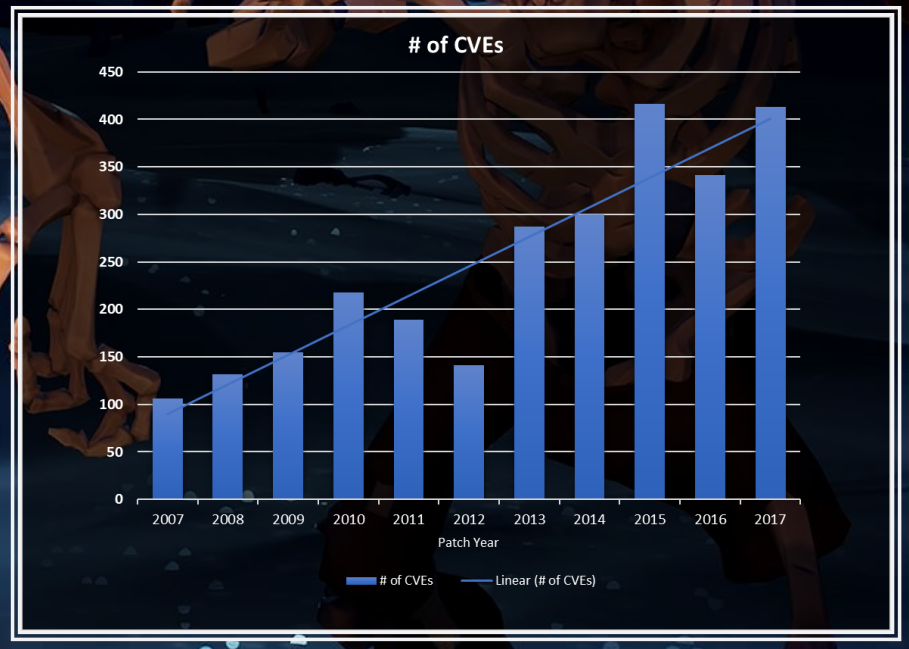


Vulnerabilities and Exploits: Different Beasts

- Vulnerabilities reported to MSRC - increased six fold
- RCE/EOP vulnerabilities receiving updates - increased four fold
- Exploits since 2010 peak - decreased by eight fold

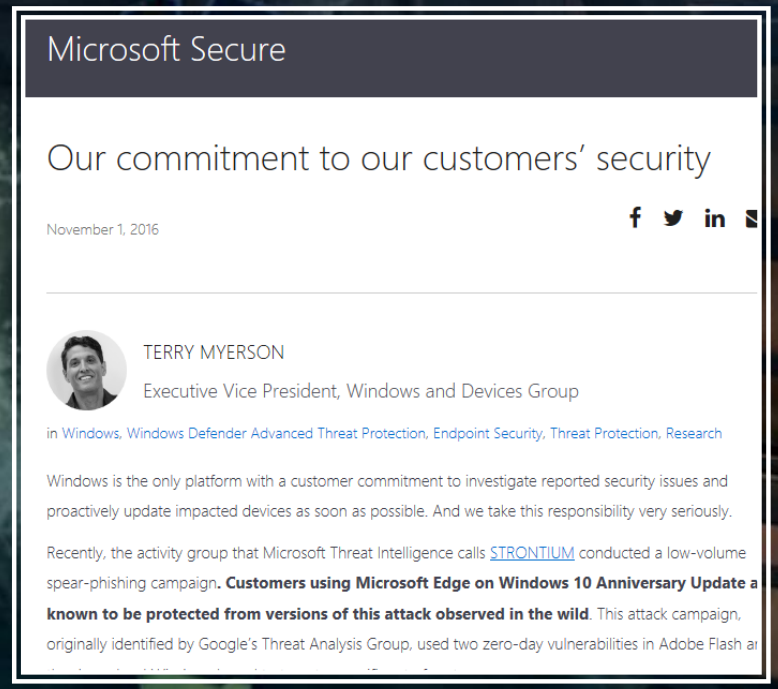






No resting on laurels

- Let's delve into those 2017 RCE exploits….
  - Most related to APTs in some way
  - APTs using exploits and getting caught
    - STRONTIUM
    - Lazarus / ZINC
  - Leaky ships:
    - Vault 7 & Shadow Broker
    - Then used by other APTs
- MSRC not blasé
  - Pwn2Own, Power of Community



Microsoft Secure

Our commitment to our customers' security

November 1, 2016

TERRY MYERSON

Executive Vice President, Windows and Devices Group

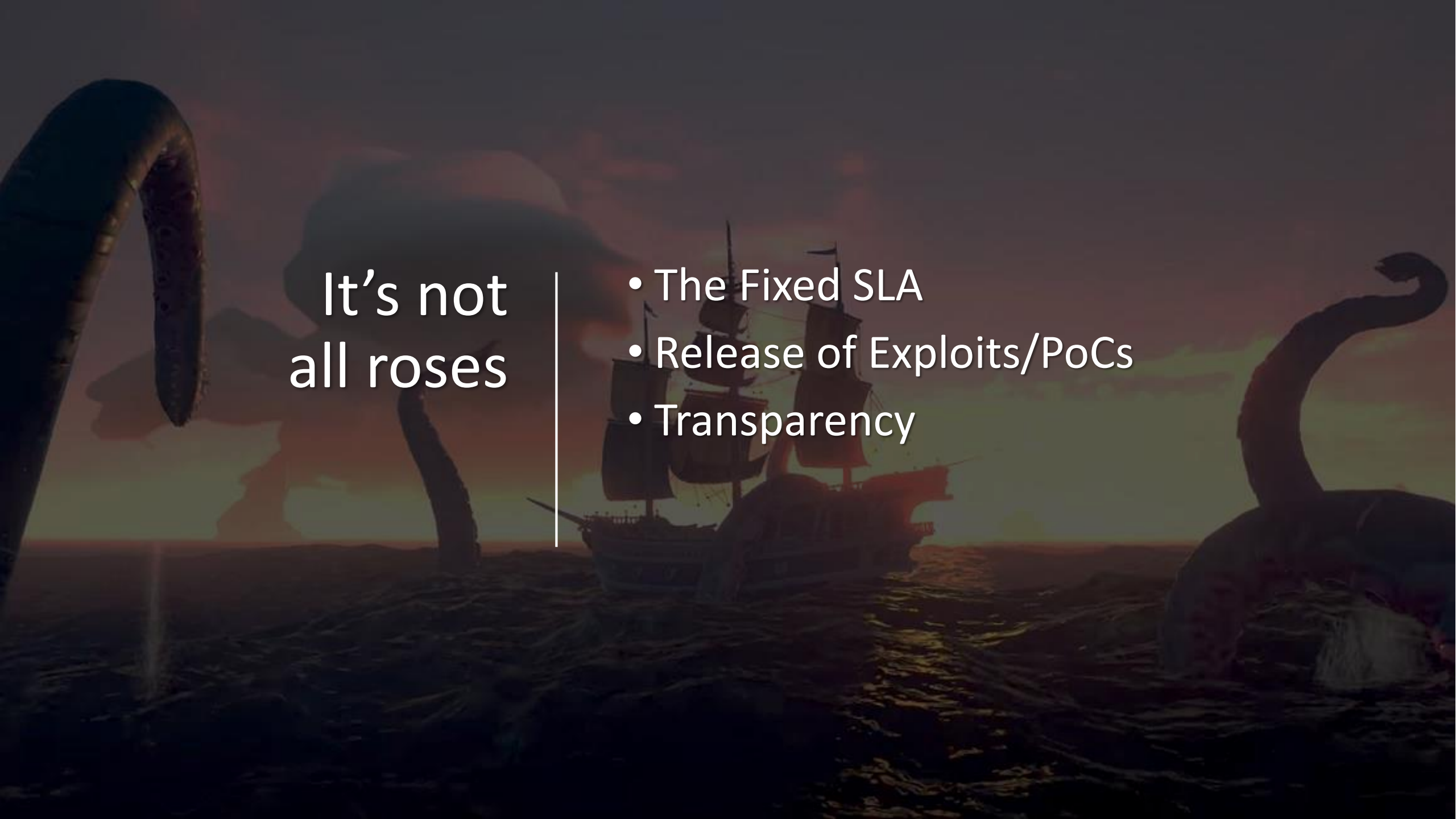
in Windows, Windows Defender Advanced Threat Protection, Endpoint Security, Threat Protection, Research

Windows is the only platform with a customer commitment to investigate reported security issues and proactively update impacted devices as soon as possible. And we take this responsibility very seriously.

Recently, the activity group that Microsoft Threat Intelligence calls STRONTIUM conducted a low-volume spear-phishing campaign. **Customers using Microsoft Edge on Windows 10 Anniversary Update a known to be protected from versions of this attack observed in the wild**. This attack campaign, originally identified by Google's Threat Analysis Group, used two zero-day vulnerabilities in Adobe Flash ar

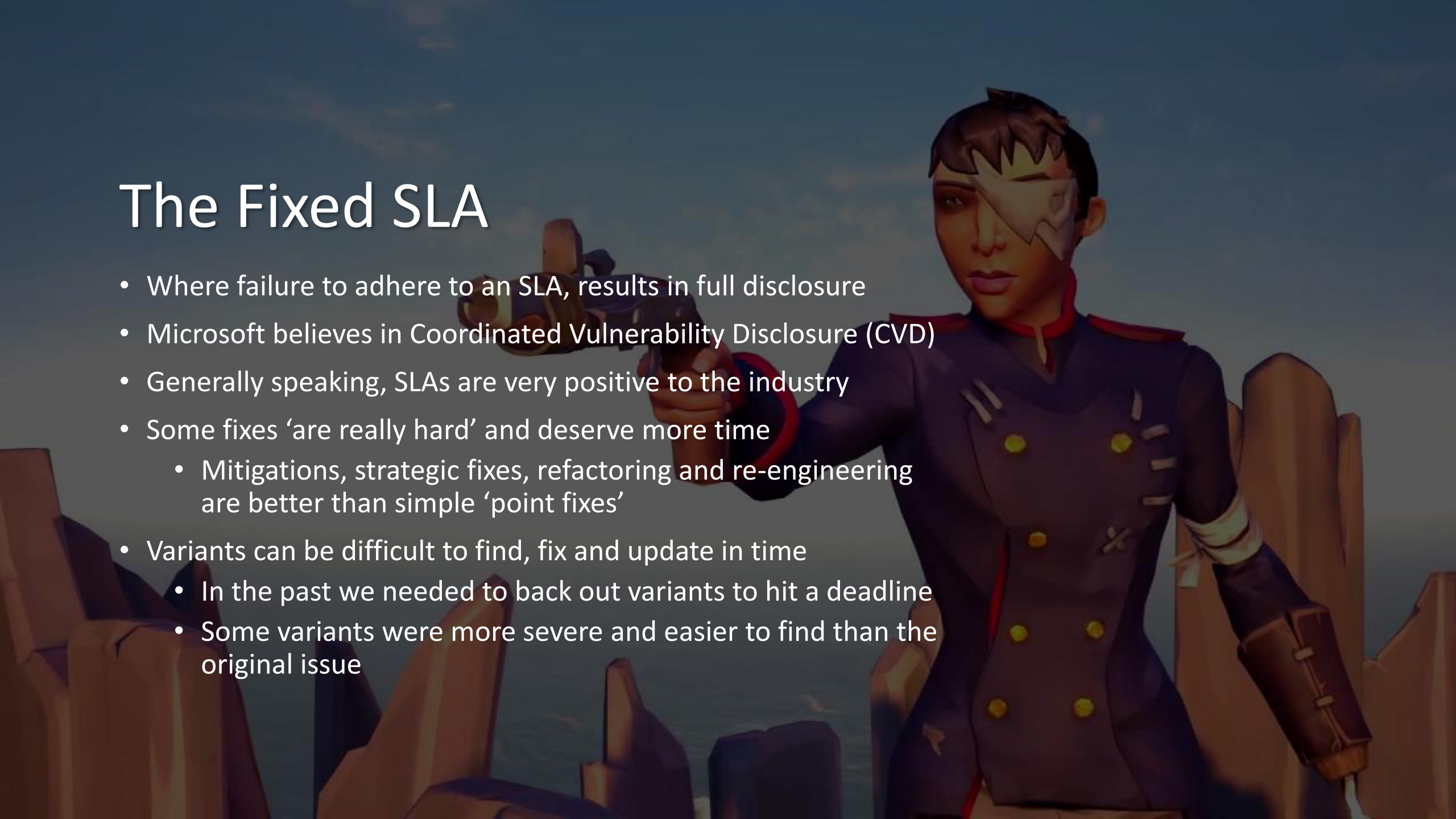
Conferences
Having Boots on the Ground

It’s not all about vulnerabilities
“Deny macros from the ‘outside’ ”


It’s not all roses
• The Fixed SLA
• Release of Exploits/PoCs
• Transparency

The Fixed SLA

- Where failure to adhere to an SLA, results in full disclosure
- Microsoft believes in Coordinated Vulnerability Disclosure (CVD)
- Generally speaking, SLAs are very positive to the industry
- Some fixes ‘are really hard’ and deserve more time
  - Mitigations, strategic fixes, refactoring and re-engineering are better than simple ‘point fixes’
- Variants can be difficult to find, fix and update in time
  - In the past we needed to back out variants to hit a deadline
  - Some variants were more severe and easier to find than the original issue



The Fixed SLA...

- Penalised for regression testing, penalised again if an issue is discovered
- Regression testing is **imperative** to security...
- Much time wasted fighting pointless fights
- Sometimes there are major issues, no need to make things worse for customers →
- One size does not fit all, Spectre/Meltdown →

- Prioritization should be based on real risk to customers

February 2017 security update release

Rate this article ★★★★★

MSRC Team February 14, 2017 Share 302 933 0

UPDATE: 2/15/17: We will deliver updates as part of the planned March Update Tuesday, March 14, 2017.

Our top priority is to provide the best possible experience for customers in maintaining and protecting their systems. This month, we discovered a last minute issue that could impact some customers and was not resolved in time for our planned updates today.

After considering all options, we made the decision to delay this month's updates. We apologize for any inconvenience caused by this change to the existing plan.

MSRC

The Register®
Biting the hand that feeds IT

Security

Mad March Meltdown! Microsoft's patch for a patch for a patch may need another patch

If at first, er, second, ah, third, no, fourth, you fail, sadly, you're probably Redmond

By Shaun Nichols in San Francisco 3 Apr 2018 at 19:05 53 SHARE ▼

Release of Exploits/PoCs

- Release of vulnerability ‘Proof of Concepts’ and exploits can be very damaging, WannaCry:
  - 150+ countries, 200,000+ computers impacted
  - $10+ million in ransom, $8+ billion in business disruption costs
- Customers needlessly punished
- WannaCry, NotPetya & Exploit Kits highlight ‘even today’ customers for various reasons sometimes don’t update
- Internal 2016 review highlighted PoCs making their way to Exploit Kits (Angler, Nuclear) between 10 and 40 days after update available
  - Many Adobe Flash vulns in Exploit Kits were only integrated after POC was released
- Collisions are rare, no SMB case in 2016...
- Deter release of PoC for as long as possible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Technology

NHS 'could have prevented' WannaCry ransomware attack

27 October 2017 | Share

Analysis - by Rory Cellan-Jones, technology correspondent

For many executives, a serious cyber-attack is now very high on their list of risks to their organisations and a priority for disaster planning.

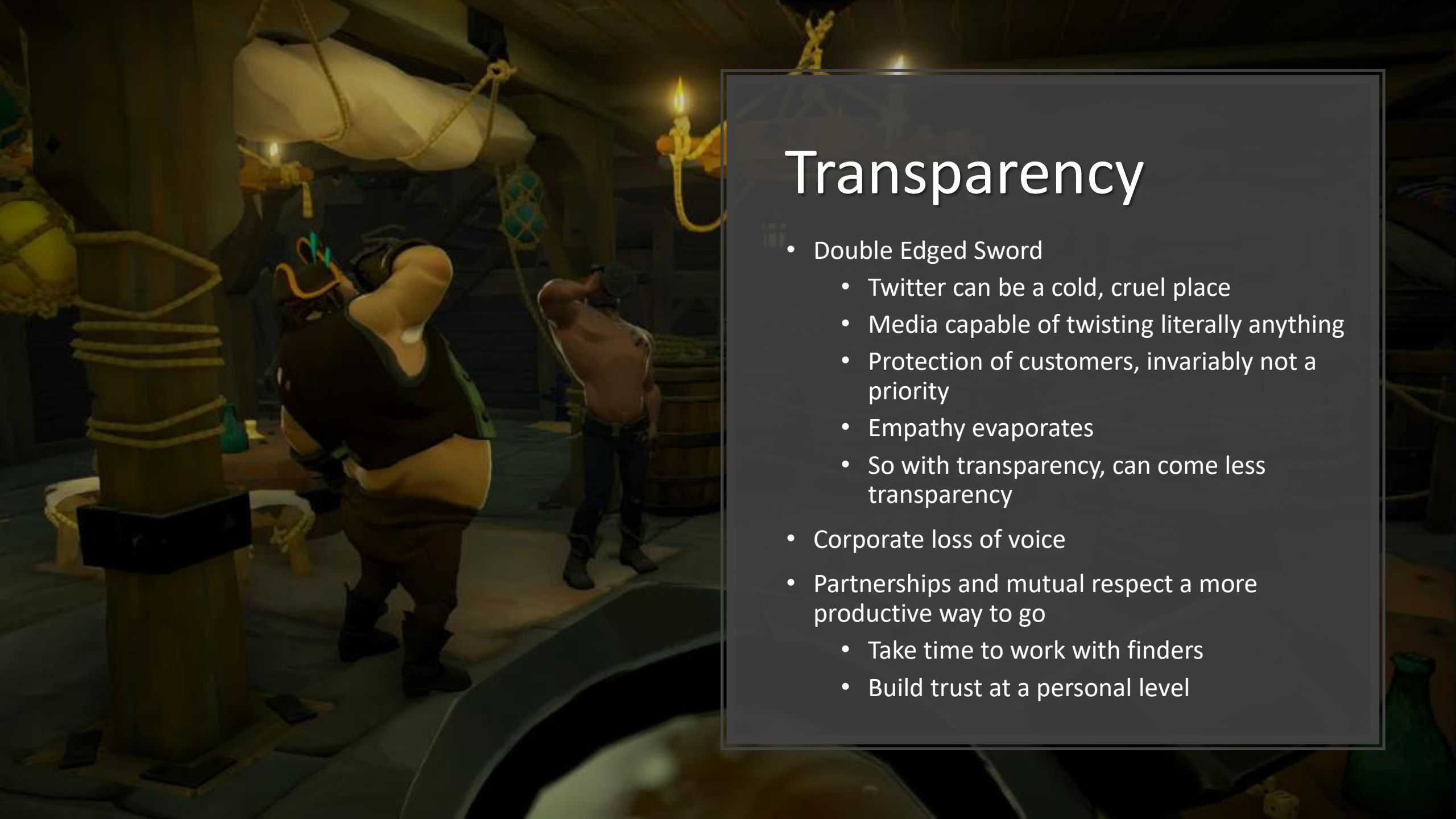
So what is most shocking in this report is the lack of planning at a local level in the NHS for such an event.

To be fair, the Department of Health had developed a plan - it was just that it had not been properly communicated or tested in the NHS trusts. When disaster struck, nobody seemed to know who was in charge or what to do.

Of course, all of this could have been avoided if security patches had been applied to protect the Windows 7 systems common throughout the NHS. Once again, there had been warnings sent out by NHS Digital, but many trusts failed to act upon them - though in that they were no different from many organisations around the world that were also hit.


Boeing hit by WannaCry virus, but says attack caused little damage

Originally published March 28, 2018 at 3:16 pm | *Updated March 28, 2018 at 9:16 pm*



Transparency

- Double Edged Sword
  - Twitter can be a cold, cruel place
  - Media capable of twisting literally anything
  - Protection of customers, invariably not a priority
  - Empathy evaporates
  - So with transparency, can come less transparency
- Corporate loss of voice
- Partnerships and mutual respect a more productive way to go
  - Take time to work with finders
  - Build trust at a personal level

10 Years, what's changed?

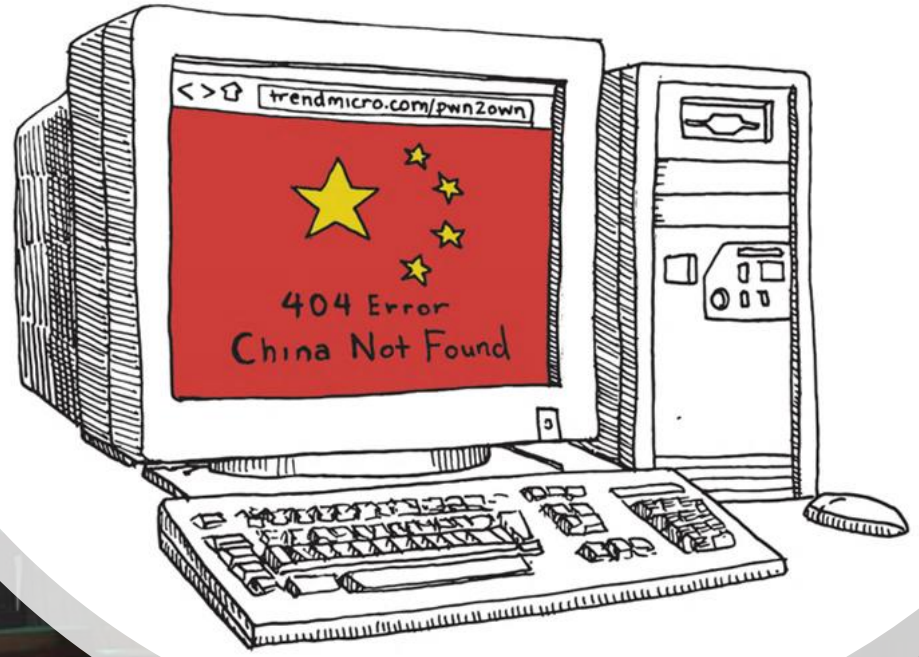
- VR and exploit creation is expensive
  - Exploit in Windows fetches $300,000
- The small pool of external security researchers are now spread amongst many platforms, looking at an increasing harder problem
- The industry needs finders, but ROI and trust is low →
- Moved from finding bugs to removing bug classes
- An increasing percentage of finders are expecting fixes at the speed of Twitter, but speed of update is almost irrelevant due to lack of collisions

China hoards its hackers
yone loses

country is MIA at one of the year's most important security competitions.

Violet Blue, @violetblue
03.16.18 in Security

1079
Shares



Where are we going?

- More focus:
  - Protecting Cloud and AI Services
  - Validating the Supply Chain
  - Validating Open Source
  - Removing memory corruption vulns OAFA
    - Is Rust the answer?
- More vulns, not fewer ☺
- Greater automation to handle those vulns

Thank You

- Huge thank you and respect to all our finders, the top ones are →
- Questions?

ABDEL HAFID AIT CHIKH
ADRIAN IVASCU
AJAY KULAL
ALEX IONESCU
ANATOLII BENCH
ANDREAS SANDBLAD
ANDY DAVIS
ANTON IVANOV
ARUN SHARMA
ASHAR JAVED
ATTE KETTUNEN
BEE13OY
BEN HAWKES
BEREND-JAN WEVER
BILLY LEONARD
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