Vulnerability Research as a lifestyle

Syed Faraz Abrar

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- Cyber Security Undergraduate @ Curtin University

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- Cyber Security Undergraduate @ Curtin University
- Security Researcher @ elttam

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- Cyber Security Undergraduate @ Curtin University
- Security Researcher @ elttam
- Focus on low level vulnerability research

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What is Vulnerability Research?

- The act of studying and analyzing the internals of some specific software with the aim of finding vulnerabilities

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What is Vulnerability Research?

- The act of studying and analyzing the internals of some specific software with the aim of finding vulnerabilities
- A subset of “Security Research”
- Usually involves:
  - Code auditing / review
  - Reverse engineering
  - Automated static analysis
  - Fuzzing

Why bother?

- Hacker mindset

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- It’s intellectually challenging

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Why bother?

- Hacker mindset
- It’s intellectually challenging
- There’s money involved
- It’s fun!

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How do you get started?

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- Teaches you about bug classes

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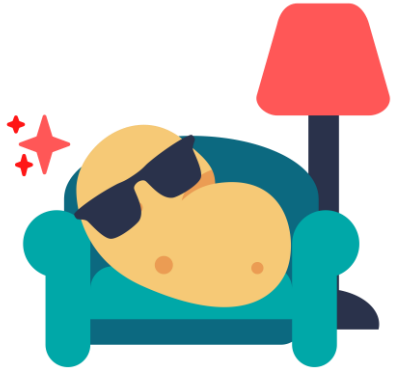
  - Harder CTFs are very realistic
- Teaches you how to learn
- Teaches you about bug classes
- Focus on exploitation more than vulnerability research



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What next?

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What next?

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  - Any IoT device / embedded system
  - A big target
- Read all existing research (if applicable)
- Study past vulnerabilities (if applicable)
- Profit!

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Professional roles

- Security Engineer

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- Security Engineer
- Security Researcher

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- Security Engineer
- Security Researcher
- Security Consultant

Bug Bounty Programs

- Platforms such as Synack, HackerOne, Bugcrowd

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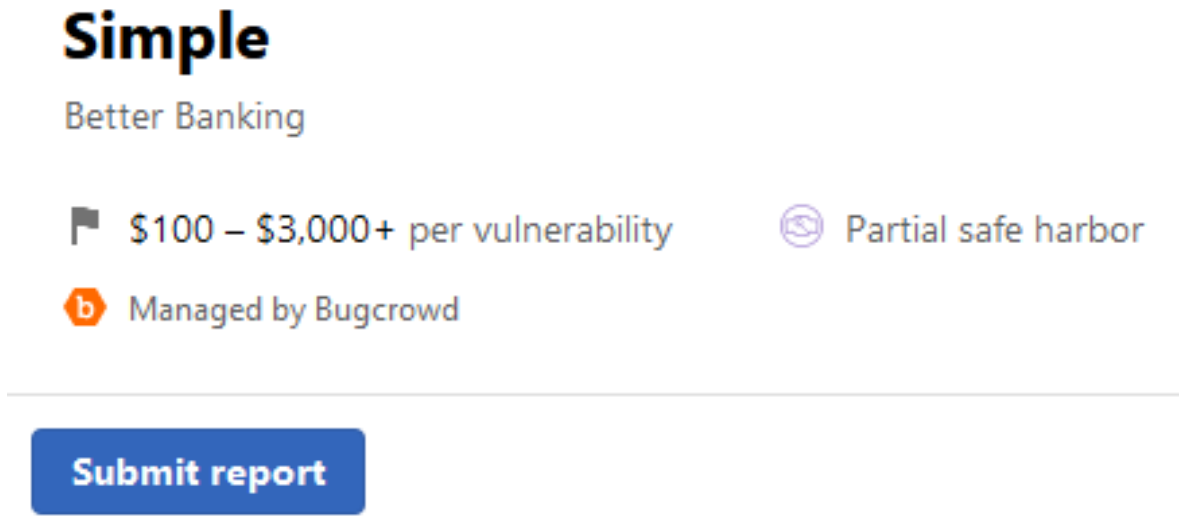

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Vulnerability Rewards Programs

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  - Trend Micro’s Zero Day Initiative

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  - Apple VRP ($25,000 - $1,000,000)
  - Trend Micro’s Zero Day Initiative
- There are a lot more!

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Exploit shops

- Buys full chain exploits
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Exploit shops

- Buys full chain exploits
  - Zerodium
  - Exodus Intel’s Research Sponsorship Program
- Usually pay a lot more than any VRP
- Only disadvantage – requires full chain exploits

ZERODIUM Payouts for Desktops/Servers*

Windows
macOS
Linux/BSD
Any OS

RCE: Remote Code Execution
LPE: Local Privilege Escalation
SBX: Sandbox Escape or Bypass
VME: Virtual Machine Escape

Up to $1,000,000									1.001 Win RCE Zero Click (Win)
Up to $500,000							3.001 Chrome RCE+LPE (Win)	2.001 Apache RCE (Linux)	2.002 MS IIS RCE (Win)
Up to $250,000					5.001 MS Outlook RCE (Win)		4.001 MS Exchange RCE (Win)	2.003 OpenSSL RCE (Linux)	2.004 PHP RCE (Linux)
Up to $200,000	6.001 VMware ESXi VME	5.002 Thunderbird RCE (Win/Linux)		4.002 Sendmail RCE (Linux)	4.003 Postfix RCE (Linux)		4.004 Dovecot RCE (Linux)	4.005 Exim RCE (Linux)	2.005 nginx RCE (Linux)
Up to $100,000		3.002 Safari RCE+LPE (Mac)	3.003 Edge RCE+LPE (Win)	3.004 Firefox RCE+LPE (Win)	5.003 Word/Excel RCE (Win)	7.001 WordPress RCE (Linux)	7.002 cPanel/WHM RCE (Linux)	7.003 Plesk RCE (Linux)	7.004 Webmin RCE (Linux)
Up to $80,000	6.002 VMware WS VME (Win/Linux)					5.004 Adobe PDF RCE+SBX (Win)	5.005 WinRAR RCE (Win)	5.006 7-Zip RCE (Win)	6.003 Windows LPE/SBX (Win)
Up to $50,000	6.004 USB LPE (Win/Mac)	8.001 Antivirus RCE (Win)		5.007 WinZip RCE (Win)	5.008 tar RCE (Linux)	6.005 macOS LPE/SBX (Mac)		6.006 Linux LPE (Linux)	6.007 BSD LPE (BSD)
Up to $10,000	9.001 Routers RCE	8.002 Antivirus LPE (Win)	7.005 phpBB RCE (Linux)	7.006 vBulletin RCE (Linux)	7.007 MyBB RCE (Linux)	7.008 Joomla RCE (Linux)	7.009 Drupal RCE (Linux)	7.010 Roundcube RCE (Linux)	7.011 Horde RCE (Linux)

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Competitions

- Researchers showcase exploits

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- Competition organisers pay for exploits

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Competitions

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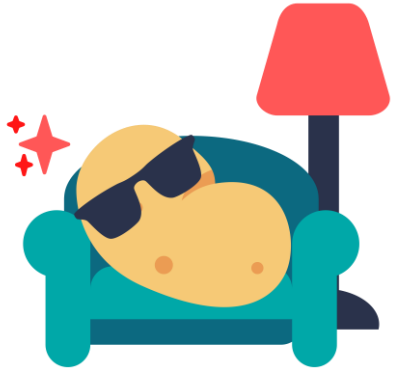
- Competition organisers pay for exploits
- Tianfu Cup
- Pwn2Own
- TyphoonPWN
- And a couple others



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Thank you!

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