Vaibhav Hemant Dixit

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EDUCATION

Master of Science, Computer Science, Arizona State University, Tempe, AZ ***May 2018, GPA 3.67***

Courses - Software Security, Automated Binary Analysis, Foundation of Algorithms, Embedded Operating System Internals

Bachelor of Technology, Information Technology, Vellore Institute of Technology, Tamil Nadu, India ***May 2013, GPA 3.6***

SKILLS

Languages - *Proficient* - C, Java; *Familiar* - Python, JavaScript, Shell, Yang. **Tools:** Gdb, Wireshark, Objdump, IDA, Scapy.

Others - Pentesting, OpenFlow, OpenStack, TCP/IP, WLAN, ELK, Android, Git, Docker, Jenkins, Eclipse, Linux, Windows.

RESEARCH EXPERIENCE

Graduate Research Assistant, *Center for Cybersecurity and Digital Forensics, ASU* ***Dec 2016 to present***

- CVEs: **CVE-2017-1000406** (Web cache), **CVE-2017-1000411** (DoS), **CVE-2018-1078** (Advance Persistent Threat)
- PUBLICATIONS († First author) (‡ Co-author)
  - † Challenges and Preparedness of SDN-based **Firewalls** at ACM SDNNFV Workshop **2018**, Tempe, Arizona.
  - ‡ Science **DMZ**: Software Defined Networking based **Secured** Cloud **Testbed** at IEEE NFV-SDN **2017**, Berlin.
  - ‡ HONEYPROXY: Design and Implementation of Next-Generation **Honeynet** via SDN at IEEE CNS **2017**, Vegas.

PROFESSIONAL EXPERIENCE

Software Engineer, *Samsung Electronics, India* ***Jul 2013 to Jun 2016***

- **Built advanced features** like 802.11w, secret SSID and multiband support. Made control path handlers at kernel space and patched Google Android supplicant at user space.
- **Implemented and improved** WEP, WPA, WPA2 secured connection procedures for Wi-Fi softAP driver. Quickly identified critical kernel bugs like memory leaks and race conditions in the driver and **for features not directly owned**.
- Worked **beyond assigned duties to automate the process** of build, sanity and stress testing: linked scripts with Gerrit. **Reduced overall bug fixing time** and made a direct impact in winning agile deadlines by a minimum profit of 3-6 days.

ACADEMIC PROJECTS

- **Evolutionary mutational fuzzer**: ***Jan 2018 to Mar 2018***
  Developed a Python based automatic binary fuzzer to find the vulnerabilities in the executable programs. Used Gdb and Valgrind to trace the basic blocks inside the assembly version of the binary. Mutating the input seed using bit manipulation techniques to cover infinite branches of the code and make it crash.
- **Advanced software firewall for SDN:** ***Jun 2017 to Nov 2017***
  Single handedly designed a centralized Java application for policy conflict detection and dynamic resolution which pulled topology information using OpenFlow APIs and generated a **complex logical graph of flow rules** to validated **security compliance**. Research findings are published in ACM security workshop.
- **Cloud framework for securing campus networks**: ***Jan 2017 to Jul 2017***
  Strengthening ASU campus network security by formulating **adaptive security** mechanism on the perimeter network. **Deployed a countermeasure** generation algorithm on ELK Cluster. Results of **research proved useful** in blacklisting IPs.
- **Framework for exploit detection and patching in Capture the Flag competition**: ***Feb 2017 to Apr 2017***
  Participated in a project based CTF game. Contributed to defense framework to reverse engineer the binaries, patch web vulnerabilities in real time and included an attack reflector using Python, Scapy. Won the iCTF competition.
- **Embedded programming in Intel Quark based Galileo board**: ***Sep 2016 to Nov 2016***
  Project aimed to provide an understanding of internals of Linux and RTOS kernel architecture by implementing device drivers for ultrasonic sensor and GPIO pins. Programmed **ioctls**, **syscall**, **static, dynamic probes, MISC drivers**, etc.

ACTIVITIES

- Member of ASU's blue team of 8 in **Collegiate Cyber Defense Competition**: cleared qualifiers, preparing for regionals.
- DIY projects on Raspberry Pi – Making Python recipes/C-drivers for smart home automation to **remotely** control lights.