

Manoj Vignesh KM

SECURITY SOFTWARE ENGINEER · AUTOMATION EXPERT

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“Contributing to the world’s cybersecurity needs with automation.”

Education

Georgia Institute of Technology

M.S. IN COMPUTER SCIENCE

- Computing Specialization

Atlanta, Georgia, US

Aug 2021 - Dec 2023 (Expected)

PES Institute of Technology

B.E. IN COMPUTER SCIENCE AND ENGINEERING

- Gold medalist with a grade score of **9.69** and rank **5**

Bengaluru, Karnataka, India

Aug 2014 - Aug 2018

Industry Experience

Postman

SECURITY ENGINEER

- **CSPM/CWPM Vendor Assessment:** Assessed multiple CSPM/CWPM vendors against Postman’s cloud security requirements. The assessment and the deal improved the visibility of the cloud infrastructure by 3x (based on number of actionable alerts), reduced the cost by about 250% and reduced the maintenance efforts by about 200%.
- **Custom Security Controls:** Developed custom security controls using AWS lambda, Python, Node JS for Postman’s AWS environment. This improved the visibility by a further 20%.
- **Threat modelling:** Performed threat modelling at multiple layers of Postman cloud and web application infrastructure. This established a framework to measure security testing coverage and improved the efficiency of VA/PT process.
- **Security Regression testing systems:** Built and improved 7+ automated security regression testing systems to continuously monitor releases of critical services.
- **Vulnerability Assessment and Penetration Testing:** Assessed 50+ releases and 7+ major releases off security vulnerabilities in Identity, Billing and other micro services. Found 5+ security vulnerabilities with CVSS score above 7.
- **Incident Response:** On call support for 300+ hours on web application security and cloud security incidents.
- **Tech Talks:** Presented multiple technology talks on API security - OWASP top 10 security in action themed around a vulnerable demo bank server, Postman as automatic security regression testing platform.

Bengaluru, Karnataka, India

Aug 2021 - Present

Intuit Inc.

IDENTITY AND ACCESS MANAGEMENT ENGINEER

- **Authorization data schema:** Strategized and performed migration of live authorization data to a new schema with zero service downtime.
- **Tech Talks:** Presented multiple technology talks on systems security - Docker container security, AWS resources and infrastructure, threat modelling authorization data access infrastructure.

Bengaluru, Karnataka, India

Nov 2020 - Aug 2021

Intuit Inc.

NETWORK AUTOMATION ENGINEER

- **Experimenting FIDO2:** Contributed to experiment of rolling out FIDO2 based multi-factor authentication on the enterprise endpoint systems. Windows hello with Active directory was used for the proof of concept. The security of systems and sign-in user experience of the beta users was observed to have improved.
- **Enterprise Infrastructure Monitoring:** Architected a secure and scalable data pipeline using AWS ECS and AWS lambda and secured with SNMP ACLs and encrypted credentials, from network and video conferencing devices to a monitoring and alerting tool, thereby reducing the MTTD issues by 50%.
- **Chatbot:** Designed, threat modelled and implemented a slack bot using python Django and various AWS services that provides a natural language conversational interface for the automation scripts to the users. Zero security incidents reported till date. It also improved user experience and reduced the learning curve required to understand an automation software.
- **Event Correlation Engine:** Developed a curious and intelligent SIEM like system using python Django in AWS ECS that correlates different network alerts to present an aggregate analysis, thereby further reducing the MTTD by 20%.
- **Infrastructure QA Automation:** Automation of pre-checks and post-checks of the network, video conferencing, and security devices before and after a change. This removed human errors and standardized the test series.
- **Asset Management:** Built a data pipeline using python Django in AWS ECS and AWS lambda for various network and video conferencing orchestration tools to ensure a single source of truth for the asset inventory.
- **Leadership:** Lead a team of 3 engineers to consistently deliver at least 70% of sprint task points. Taught, guided, and advised network engineers on python and AWS that grafted DevOps mindset and enabled the team to write scripts that automate at least 10% of their routine work.
- **Incident response:** On call support for 400+ hours on network and network automation software incidents.

Bengaluru, Karnataka, India

Aug 2018 - Nov 2020

Intuit Inc.

NETWORK AUTOMATION CO-OP

Bengaluru, Karnataka, India

Jan 2018 - Jun 2018

- **Video Conference troubleshooting:** Developed a web application using React JS and python Django that presents the hop-by-hop network health of each participant of a VC call, which reduced MTTD issues by almost 3 times.

Intuit Inc.

NETWORK AUTOMATION INTERN

Bengaluru, Karnataka, India

May 2017 - Jul 2017

- **VPN troubleshooting:** A CLI utility that gathers VPN client machine data and generates a report that is used by engineers to quickly identify the issue. This reduced the MTTD from 20 minutes to less than a minute

Research & Personal works

Applied Research

BLOGGER ON MEDIUM.COM

<https://blog.kmmanoj.me>

Nov 2018 - Present

- Article on "How complex can Authorization get?"
- ARP Spoofing custom exploit using ScaPy
- Man-in-the-middle via hoax DHCP
- DHCP starvation attack without making any DHCP requests
- Experiment to setup and learn internal network pivoting using Port forwarding
- Burpsuite plugin to capture and query proxy data from a database.
- Learning behavior of exploits and recon using SSH honeypot with cowrie.

Academic Research

INDEPENDENT RESEARCHER

Nov 2018 - Present

- **Modelling Trust Frameworks for Network-IDS (INCET 2021 - IEEE)**
Mathematically modelling human instinctive trust among systems to communicate security based trust reduction and redemption messages. [<https://doi.org/10.1109/INCET51464.2021.9456381>]
- **Tamper Detection and Correction of ELF Binaries by Remote Parties via Merkle Trees (ICCISoT 2020 - Springer)**
Efficiently identifying and patching malicious software using merkle trees before the first execution by the user. [https://doi.org/10.1007/978-3-030-66763-4_14]

Center for Cloud computing & Big Data, PES Institute of Technology

Bengaluru, Karnataka, India

RESEARCH INTERN

Jun 2016 - Dec 2017

- **Green Cloud:** Energy Efficient datacenter management under availability constraints. To design a VM allocation, migration, and scheduling policy to ensure high availability while optimizing the amount of energy consumed by the data center.
- **Digital Swachh Bharat:** Digital initiative to clean India. To research strategic placement of garbage bins and efficient track for garbage truck based on multiple parameters such as size of truck, location and volume of garbage dumps.

Skills

| | |
|--------------------|---|
| SecOps | Penetration testing, Web Application Security, Cloud Security, Network Security |
| DevSecOps | AWS, Docker, Kubernetes, Snyk, CodeQL, Burpsuite plugin |
| Tools | Burpsuite, Wireshark, GNS3, Metasploit |
| Backend | SailsJS, NodeJS, ExpressJS, Java Spring Boot, Django, Flask |
| Frontend | ReactJS, HTML5, CSS3 |
| Programming | Python, Javascript, Java, C/C++, Golang |

Extracurricular Activity

- Active **Security Blogger**, on Medium
- Currently **Ranked top 1%**, in TryHackMe Pentesting Lab
- Organized **Guest lectures**, with my alma mater on advanced subjects
- Was **Project lead**, OSINT platform at Null India
- Was **an Active member**, of Intuit's NextGenNetwork
- Was **a Representative**, of Intuit's Community Service Group

Honors & Awards

- 2021 **11/100+ rank**, Intuit Redcon CTF 2021
- 2020 **178/5000+ rank**, NahamSecCon CTF 2020
- 2020 **13/600+ rank**, June'gle CTF 2020
- 2020 **4/30+ rank**, Intuit Redcon CTF 2020
- 2019 **NextGenNetwork Champion**, at Intuit's NextGenNetwork
- 2018 **Gold Medalist**, in Computer Science and Engineering, batch 2018 of PES Institute of Technology
- 2014-18 **Professor CNR Rao Merit Scholarship award winner**, in undergraduate

Certifications

CompTIA Security+

SY0-501

October 2020

AWS Solutions Architect Associate

AWS SAA-C01

May 2019