Nikhil Tripathi

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1. Driven, goal-oriented scientific investigator recognized for exploring vulnerabilities in application layer protocols that resulted into appraised publications in various top scientific journals and conferences.

2. 5+ years experience in vulnerability assessment of popular application layer protocols and proposing defense mechanisms. Strong presentation skills built by presenting results at various specialized international conferences.

WORK EXPERIENCE

- Security Researcher (Postdoc), Fraunhofer SIT (TU Darmstadt) Germany, March 2019-Present
    - Working on a project to secure the Internet infrastructure and devise techniques for secure and privacy preserving access to and usage of Internet services and platforms.
    - Proposing robust defense mechanisms against bandwidth consuming large scale DoS attacks.
- Research Assistant, Indian Institute of Technology Indore, July 2014-January 2019
    - Worked on finding vulnerabilities in various application layer protocols that can be exploited to launch DoS attacks.
    - Also proposed various defense approaches that can be deployed as a first line of defense to counter the attacks.

EDUCATION

Doctor of Philosophy, Computer Science and Engineering, July 2014 - January 2019
Indian Institute of Technology Indore, India
CGPA: 8.2 on a scale of 10.

Master of Technology, Information Technology, July 2012 - July 2014
University of Hyderabad, India
CGPA: 9.45 on a scale of 10.

Bachelor of Technology, Computer Science and Engineering, July 2008 - June 2012
Uttar Pradesh Technical University, India
Percentage: 72.22 %

RESEARCH INTERESTS

- Internet Security
- Computer Networks
- System Security

Skills

- Programming/scripting Languages
    - Python, Core Java, C, Shell scripting
- Network Management using Linux
- Raw Socket Programming using Python
- Security configurations in cloud environments like Azure, AWS and Google

PROJECTS

- Worked on "Design and Development of a Trusted and Accountable Cloud Cmputing Platform" as a research assistant at IIT Indore.
- Worked on "Novel Application Layer DoS Attacks and Defense Mechanisms" during Ph.D. at IIT Indore.
- Worked on "An ARP-ICMP Probe Packet based Scheme to prevent ARP Poisoning and IP Exhaustion Attacks" during M.Tech at University of Hyderabad.
- Worked on a project entitled "Complete Web Hosting Services (configuration of DNS, WEB and MAIL servers)" as a part of B.Tech Final Year project.

SUMMER TRAINING

- One month summer training on "Network Management using Linux" in July 2010.

PUBLICATIONS

Journals

- Nikhil Tripathi, Neminath Hubballi, "Slow Rate Denial of Service Attacks Against HTTP/2 and Detection", Computers & Security, Elsevier, Volume 72, 2018, Page(s): 255-272. (IF: 3.062) [Published]
- Nikhil Tripathi, Neminath Hubballi, "Detecting Stealth DHCP Starvation Attack using Machine Learning Approach", Journal of Computer Virology and Hacking Techniques, Springer, Volume 14, 2018, Page(s): 233-244. [Published]
- Neminath Hubballi and Nikhil Tripathi, "A Closer Look into DHCP Starvation Attack in Wireless Networks". Computers & Security, Elsevier, Volume 65, Issue C, 2017, Page(s): 387-404. (IF: 3.062) [Published]
- Neminath Hubballi and Nikhil Tripathi, "An Event based Technique for Detecting Spoofed IP Packets", Journal of Information Security and Applications, Elsevier, Volume 35, 2017, Page(s): 32-43. (IF: 1.537) [Published]
- Nikhil Tripathi, Neminath Hubballi, "Preventing Time Synchronization in NTP's Broadcast Mode", Communicated to Computers & Security, Elsevier. (IF: 3.062) [Under Major Revision]
- Nikhil Tripathi, Neminath Hubballi, "Application Layer Denial of Service Attacks and Defense Mechanisms: A Survey", Communicated to ACM Computing Surveys. (IF: 6.131) [Communicated]

Conferences

- (Authors' order based on surnames alphabetically) Tianxiang Dai, Elias Heftrig, Philipp Jeitner, Haya Shulman, Nikhil Tripathi, Michael Waidner, "The Hijackers Guide to the Galaxy: Off-Path Taking Over Internet Resources", Communicated to 29th USENIX Security Symposium (USENIX Security 2020). [Under Major Revision]
- Neminath Hubballi, Amey Kiran Patel, Amit Kumar Meena, Nikhil Tripathi, "Cloud Security Service Level Agreements: Representation and Measurement", 38th IEEE International Conference on Computer Communications Workshops (INFOCOM WKSHPS), 2019, pp. 145-150. [Published]

- Nikhil Tripathi, Neminath Hubballi and Yogendra Singh, "How Secure are Web Servers? An Empirical Study of Slow HTTP DoS Attacks and Detection," 2016 10th International Conference on Availability, Reliability and Security (ARES), Salzburg (Austria), 2016, pp. 454-463. [Published]

- Nikhil Tripathi, Mayank Swarnkar and Neminath Hubballi, "DNS Spoofing in Local Networks Made Easy". Proceedings of 11th IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS'17), Bhubaneswar, 2017, pp. 1-6. [Published]

- Nikhil Tripathi and Neminath Hubballi, "A Probabilistic Anomaly Detection Scheme to Detect DHCP Starvation Attack". Proceedings of 10th IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS'16), IISc Bengaluru, 2016, pp. 1-6. [Published]

- Nikhil Tripathi and Neminath Hubballi, "Exploiting DHCP Server-side IP Address Conflict Detection: A DHCP Starvation Attack". Proceedings of 9th IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS'15), ISI Kolkata, 2015, Page(s): 1-3 [Published]

- Mayank Swarnkar, Neminath Hubballi, Nikhil Tripathi and Mauro Conti. "AppHunter: Mobile Application Traffic Classification", Proceedings of 12th IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS'18), Indore, 2018, pp. 1-6 [Published]

- Anuja Tayal, Neminath Hubballi and Nikhil Tripathi, "Communication Recurrence and Similarity Detection in Network Flows". Proceedings of 11th IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS'17), Bhubaneswar, 2017, pp. 1-6. [Published]

- Nikhil Tripathi and B. M. Mehtre, "Analysis of various ARP Poisoning mitigation techniques: A comparison". Proceedings of IEEE International Conference on Control, Instrumentation, Communication and Computational Techniques (ICCICCT'14), 2014, Page(s): 147-152. [Published]

- Nikhil Tripathi and B. M. Mehtre, "An ICMP based Secondary Cache approach for the detection and prevention of ARP poisoning". Proceedings of 4th IEEE International Conference on Computational Intelligence and Computing Research (ICCIC'13), 2013, Page(s): 1-6. [Published]

- Nikhil Tripathi and B. M. Mehtre, "DoS and DDoS Attacks: Impact, Analysis and Countermeasures". Proceedings of IET National Conference on Advances in Computing, Networking and Security (NCACNS'13), 2013, Page(s): 93-98. [Published]

ACADEMIC ACHIEVEMENTS

- Received an honourable mention for a research paper presented at ANTS 2015

- Invited to give a talk on Slow Rate DoS Attacks against HTTP/2 at Fraunhofer Institute for Secure Information Technology (SIT), Germany in September 2018

- Selected for participating in Inter-Research-Institute Student Seminar in Computer Science co-located with ACM India Annual Events in 2016 and 2018

- 3rd best M.Tech research project award at IDRBT, Hyderabad

- Best paper award of track at 2013 4th IEEE ICCIC conference

- Best paper award of track at 2014 IEEE ICCICCT conference

- Secured 98.14 percentile in Graduate Aptitude Test in Engineering (GATE 2012)

Community Work	• TPC member of IEEE ANTS 2018
	• Reviewer for IEEE SMC 2018
	• Reviewer for IET Information Security Journal
	• Reviewer for IET Networks Journal
	• Reviewer for Security and Communication Networks, Wiley Journal
	• Reviewer for IEEE Access Journal
Invited Talks	• Slow Rate DoS Attacks against HTTP/2 at Fraunhofer SIT, Germany (September 2018)
HOBBIES AND INTERESTS	• Passionate about music, playing guitar, trekking and reading geopolitics literature.
LANGUAGES KNOWN	• English - Read, Write, Speak.
	• Hindi - Read, Write, Speak.
	• German - Currently taking A1 course

REFERENCES

- Dr. Neminath Hubballi
  - Designation: Associate Professor, Discipline of CSE,
  - Indian Institute of Technology Indore
  - Address: Room 310, POD-D, IIT Indore, Simrol, MP-453552
  - Landline No.: +91 7324-306528
  - E-mail: neminath@iiti.ac.in

- Dr. Dr. Trapti Jain
  - Designation: Associate Professor, Discipline of EE,
  - Indian Institute of Technology Indore
  - Address: Room 303, POD-1A, IIT Indore, Simrol, MP-453552
  - Landline No.: +91 7324-306586
  - E-mail: traptij@iiti.ac.in

- Dr. B. M. Mehtre
  - Designation: Professor
  - Institute for Development and Research in Banking Technology (IDRBT), Hyderabad
  - Address: Castle Hills, Road 1, Masab Tank, Hyderabad - 500 057, Andhra Pradesh,
  - Landline No.: +91 40 2329 4142
  - E-mail: bmmehtre@idrbt.ac.in

- Dr. Abhishek Srivastava
  - Designation: Associate Professor, Discipline of CSE,
  - Indian Institute of Technology Indore
  - Address: POD-D, IIT Indore, Simrol, MP-453552
  - Landline No.: +91 7324-240769
  - E-mail: asrivastava@iiti.ac.in