QIAO KANG

PhD student, Rice University, Houston, TX 77005
(+1) 346-317-2056, qiaokang1213@gmail.com, qiaokang.org

RESEARCH INTERESTS

I am broadly interested in networking, distributed systems, and security. My current research focus is leveraging programmable network devices for efficient and secure networked systems.

EDUCATION

Rice University, USA Aug 2018 - Present
Ph.D. student

Beihang University, China Sep 2014 - Jun 2017
MS in Software Engineering

Beihang University, China Sep 2010 - Jun 2014
BS in Software Engineering

WORK EXPERIENCE

OS kernel developer, VMware Jan 2017 - Jun 2018
Network interface card (NIC) driver development in the ESXi kernel.

PUBLICATIONS

Clara: Performance Clarity for SmartNIC Offloading
Yiming Qiu*, **Qiao Kang***, Ming Liu, and Ang Chen
19th ACM Workshop on Hot Topics in Networks (**HotNets'20**), Chicago, II, USA, Nov 2020

Mitigating Network Covert Channels while Preserving Performance
Jiarong Xing, **Qiao Kang**, and Ang Chen
29th USENIX Security Symposium (**Security'20**), Boston, MA, USA, Aug 2020

Programmable In-Network Security for Context-aware BYOD Policies
Qiao Kang*, Lei Xue*, Adam Morrison*, Yuxin Tang, Ang Chen, and Xiapu Luo
29th USENIX Security Symposium (**Security'20**), Boston, MA, USA, Aug 2020

Automated Attack Discovery in Data Plane Systems
Qiao Kang, Jiarong Xing and Ang Chen
12th USENIX Workshop on Cyber Security Experimentation and Test (**CSET'19**), Santa Clara, CA, USA, Aug 2019

(* indicates equal contribution)

TALKS

Qiao Kang, "Programmable In-Network Security for Context-aware BYOD Policies"
USENIX Security'20 (online), Aug 2020

Qiao Kang, "Programmable In-Network Security for Context-aware BYOD Policies"
Computer Systems Lab, University of Washington (online), Jul 2020

Qiao Kang, "Programmable In-Network Security for Context-aware BYOD Policies"
P4 Expert Roundtable Series (online), Apr 2020

Qiao Kang, "Automated Attack Discovery in Data Plane Systems"
CSET'19, Santa Clara, CA, USA, Aug 2019

RESEARCH EXPERIENCE

Performance Clarity for SmartNIC Offloading April 2020 - Present

Offloading packet processing programs from CPUs to SmartNICs might bring significant performance benefits. However, the developer has no easy way to understand the offloaded performance beforehand. We develop Clara to provide performance clarity for SmartNIC offloading.

Automated Attack Discovery in Data plane Systems May 2019 - Present

We find a new class of network attacks to the emerging systems that rely on P4 switches. We propose an approach to discovering attack vectors in these systems in an automated manner.

Mitigating Network Covert Channels without Performance Loss May 2019 - Nov 2019

We design and implement a system called NetWarden, which leverages emerging P4 switches to mitigate network covert channels while preserving TCP performance.

Programmable In-Network Security for BYOD Policies Aug 2018 - Sep 2019

We present a new security paradigm called programmable in-network security (Poise) for enterprise networks. Poise enforces access control based on dynamic run-time contexts, such as the GPS locations of mobile devices.

SKILLS

Expertise in C, familiar with C++, Python and Shell

Familiar with OS kernel development, especially network device drivers

Familiar with P4 (a domain-specific language for data plane programming)

AWARDS

Outstanding Graduate Award of Beihang University, 2017

National Scholarship Award of China, 2013

First-prize Scholarship of Academic Performance of Beihang University, 2013