

Cyberinfrastructure Lab
Department of Integrated Information Technology
College of Engineering and Computing

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Meeting University of South Carolina - National Center for Credibility Assessment (NCCA) - Defense
Counterintelligence and Security Agency (DCSA)
USC AI Institute - November 8, 2022



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- The University of South Carolina is a National Center of Academic Excellence (CAE) for Cyber Defense Education (CAE-CDE), and a CAE for Research (CAE-R)
 - Designation made by the National Security Agency (NSA)
 - Computer Science and Engineering (CSE) is the primary unit
 - IIT is the main department supporting CSE
- The College of Engineering and Computing offers ABET Accredited Programs
 - B. Sc. Computer Science (CSE)
 - B. Sc. Information Technology (IIT)
 - Multiple minors; e.g., Cybersecurity Operations, Networks (IIT)

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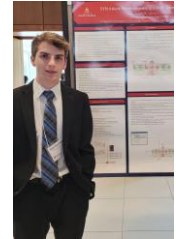
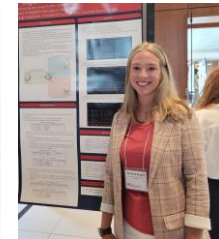
- Partnerships

- Undergraduate research in cyber
- Internships at national labs, private companies, agencies
- USC supports training programs in cyber; e.g., U.S. National guard, U.S. Army Cyber-center of Excellence, Lawrence Berkeley National Laboratory (LBNL), National Research and Education Networks

LBNL / USC training workshops



Internships, undergraduate research



CIO Savannah River National Laboratory (SRNL), interns

Undergraduate researchers

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ROTC cybersecurity training, ONR undergraduate research



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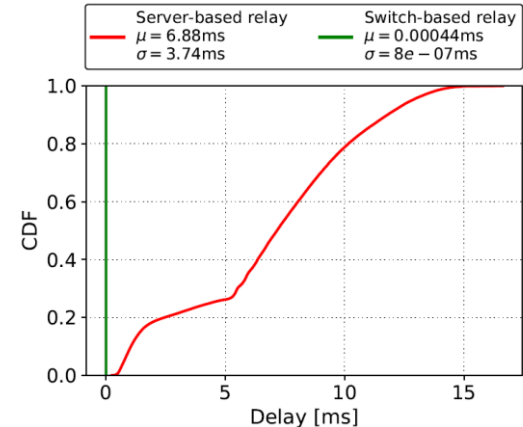


- Development of apps running on domain-specific (network) processors for packets
 - Network processors provide granular visibility of events (nanosecond resolution)
 - They can detect /process events much faster than general-purpose CPUs
 - Collaboration / agreement with Intel



Application example: voice processing¹

	Network Processor	General-purpose CPU
Cost	\$6,000	\$ 10,000 - 25,000
Capacity	~35M connections/switch	~500 connections/core
Latency	400 nanoseconds	Tens-hundreds of msec



¹E. Kfoury, J. Crichigno, E. Bou-Harb, V. Gurevich, "Offloading Media Traffic to Programmable Data Plane Switches," IEEE ICC, June 2020.

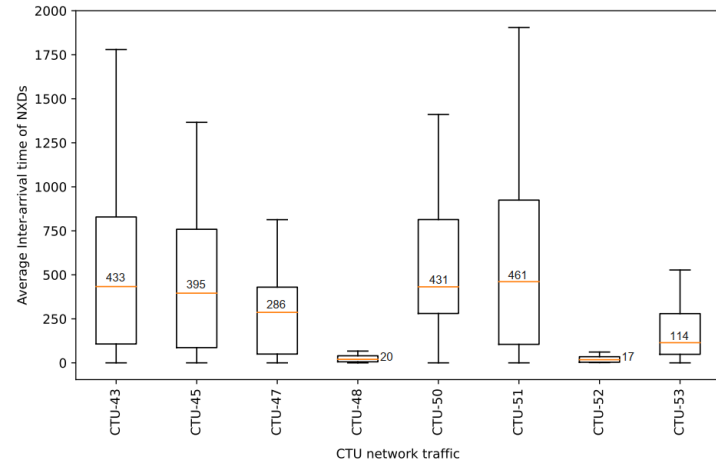
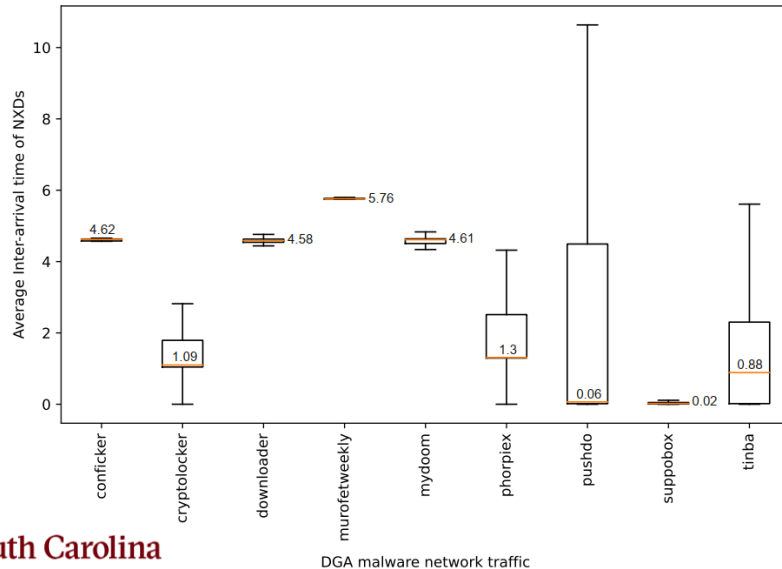
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Application example: malware detection based on non-existing domain (NXD) packets²



²A. AlSabeH, E. Kfoury, J. Crichigno, E. Bou-Harb, "P4DDPI: Securing P4-Programmable Data Plane Networks via DNS Deep Packet Inspection", NDSS, Apr 2022.