

“TRAINING WORKSHOP FOR NETWORK ENGINEERS AND EDUCATORS ON TOOLS AND PROTOCOLS FOR HIGH-SPEED NETWORKS”

The Cyberinfrastructure Network Expertise (CNE)
The Engagement and Performance Operations Center (EPOC)

July 22-23, 2019
University of South Carolina, Columbia, SC



Supported by NSF Awards 1829698 and 1826994

Training Workshop

- Initiative of the Cyberinfrastructure Network Expertise
 - University of South Carolina (UofSC)
 - Florida Atlantic University (FAU)
 - University of South Florida (USF)
- and the Engagement and Performance Operations Center
 - The Energy Science Network (ESnet)
 - Indiana University (IU)

Training Workshop

- 2017 NSF Campus Cyberinfrastructure (CC) meeting:

Comments by attendees of 2017 NSF CC meeting¹

“Working with researchers... HPC, Science DMZ, DTN, Big Data and/or GPU platforms”

“Very difficult to find, or nonexistent - difficult to retain (CI engineers)”

“...time to hire (CI engineers)... ended up taking 10 months...”

“Combination of education and experience...”

“At least one tour of duty as an intern or apprentice...”

“System and network engineering, user support experience, good communication...”

“...Routing and switching (e.g., Juniper, Cisco), ...training in security (e.g., Palo Alto or similar), cabling”

“Working knowledge of theory and practice underlying VLAN/LAN/WAN... Windows and Unix/Linux”

¹ http://www.thequilt.net/wp-content/uploads/NSF-2017-PI-Workshop-CI-Engineer-Survey_v4.pdf

Agenda

- Nine presentations
- Five hands-on vLabs sessions
- Two panels

DAY 1: Monday, July 22 - University of South Carolina		
Time	Topic	Presenter
8:00 - 8:30	Breakfast	
8:30 - 8:40	Welcome	Jorge Crichigno (UofSC), Jason Zurawski (ESnet)
8:40 - 9:10	Importance of Cyberinfrastructure for Scientific Discovery	F. Alex Feltus (Clemson)
9:10 - 9:45	Cyberinfrastructure for Big Science Flows: Science DMZs	Jason Zurawski (ESnet)
9:45 - 10:15	Break	
10:15 - 10:45	End devices in Science DMZs: DTNs	Jason Zurawski (ESnet)
10:45 - 12:00	Hands-on vLabs: WAN emulation and performance tools	Jorge Crichigno (UofSC), Elie Kfoury (UofSC)
12:00 - 1:00	Lunch	
1:00 - 1:30	Role of TCP in large data transfers	Jorge Crichigno (UofSC)
1:30 - 2:30	Hands-on vLabs: TCP best practices; TCP congestion controls: BBR, HTCP, Cubic, Reno	Jorge Crichigno (UofSC), Elie Kfoury (UofSC)
2:30 - 2:45	Break	
2:45 - 3:15	Monitoring end-to-end systems: perfSONAR	Jason Zurawski (ESnet)
3:15 - 4:15	Hands-on vLabs: measuring metrics in multi-domain networks with perfSONAR	Jorge Crichigno (UofSC), Jose Gomez (UofSC)
4:15 - 4:45	Panel: Best practices, DTNs, research networks, perfSONAR	Moderator: Nasir Ghani (USF). Panel: P. Sagona (RC), Damian Clarke (Alabama A&M), F. Alex Feltus (Clemson), Jason Boryk (UofSC)
4:45 - 5:00	Questions, wrap-up day one	Jorge Crichigno (UofSC), Jason Zurawski (ESnet)

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DAY 2: Tuesday, July 23 - University of South Carolina		
Time	Topic	Presenter
8:00 - 8:30	Breakfast	
8:30 - 9:00	The Cyberinfrastructure at National Laboratories	Steve Tibrea (Savannah River National Laboratory)
9:00 - 9:20	Monitoring end-to-end systems: perfSONAR's MaDDash	Jason Zurawski (ESnet), Andrew Lake (ESnet)
9:20 - 10:00	Hands-on vLabs: measuring and visualizing RTT, throughput, packet loss with MaDDash	Jorge Crichigno (UofSC), Jose Gomez (UofSC)
10:00 - 10:30	Break	
10:30 - 11:10	Security aspects of Science DMZs, high-throughput high-latency networks	Von Welch (Center for Applied Cybersecurity Research - CACR)
11:10 - 11:45	Bro Intrusion Detection System (IDS)	Elias Bou-Harb (Florida Atlantic University - FAU)
11:45 - 12:45	Lunch	
12:45 - 2:00	Hands-on vLabs: Bro IDS	Elias Bou-Harb (FAU), Antonio Mangino (FAU)
2:00 - 2:45	Panel: Security aspects and best practices in high-speed networks	Moderator: Nasir Ghani (USF). Panel: E. Bou-Harb (FAU), V. Welch (CACR), Damian Clarke (Alabama A&M), Jason Zurawski (ESnet)
2:45 - 3:00	Questions, wrap-up day two	Jorge Crichigno (UofSC), Jason Zurawski (ESnet)

Network Information

“uscgust” wireless network	You must create an account to access Internet
http://ce.sc.edu/cyberinfra/workshop.html	Workshop website
https://netlab.cec.sc.edu/	URL of the virtual lab platform Username: lastname (lowercase letters) Password: nsf2019
https://10.173.78.50	IP address of the virtual lab platform (for users using the students’ wireless network)

Your Input is Important!

- We expect this to be the first of many activities / workshops
- Your feedback at the end of the workshop will be very appreciated