

# “Workshop on P4 Programmable Switches”

Organized by

The University of South Carolina (UofSC)  
ESnet and The Engagement and Performance Operations Center (EPOC)  
Great Plains Network (GPN)

February 16, 23, 2022  
Online

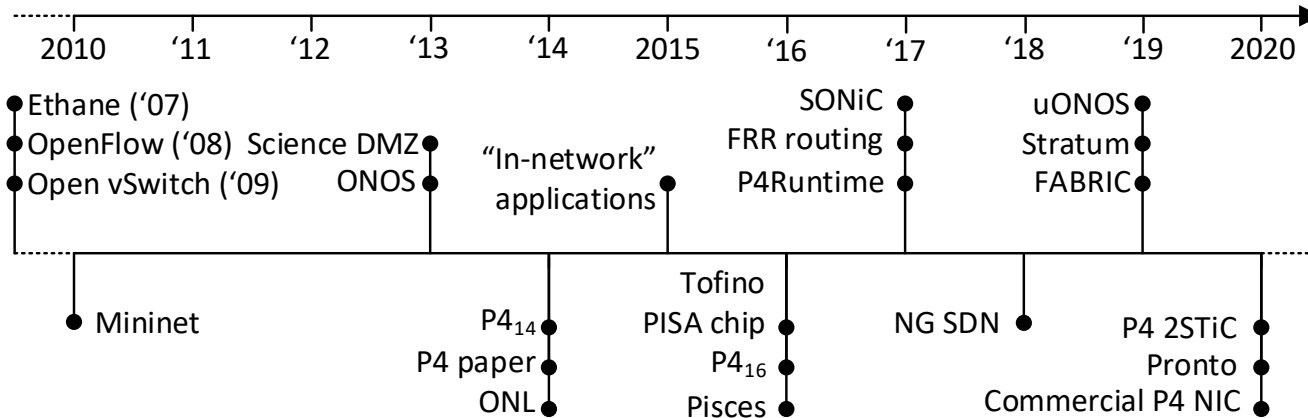
Jorge Crichigno  
UofSC

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# Training Workshop

- There is an increasing trend towards programmability and open source



# Training Workshop

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- Facilitate the adoption of programmable P4 devices by CI / IT professionals
- Help integrate P4 material into associate, bachelor, and graduate degrees
  - Development and dissemination of virtual labs
  - Dissemination of best practices and available resources (courses, testbeds, etc.)
- Workshop website:  
[http://ce.sc.edu/cyberinfra/p4\\_workshop\\_feb\\_2022.html](http://ce.sc.edu/cyberinfra/p4_workshop_feb_2022.html)

# Agenda

Day 1: February 16, 2022

Time (ET) (pm)	Topic	Presenter
01:00 – 01:10	Welcome, agenda	Jorge Crichigno (UofSC), Jason Zurawski (ESnet and EPOC), James Deaton (GPN)
01:10 – 02:00	FABRIC, the programmable research infrastructure	KC Wang (Clemson), Paul Ruth (RENCI)
02:00 – 02:45	Overview of P4 and programmable switches	Vladimir Gurevich (Barefoot Networks - Intel)
02:45 – 03:00	Break	
03:00 – 03:50	Hands on Session 1: intro to P4 and BMv2; writing, compiling, and downloading P4 code to the switch	Elie Kfoury, Jose Gomez (UofSC)
03:50 – 04:00	Break	
04:00 – 04:50	Hands on Session 2: parser implementation; writing a parser for IPv4 and IPv6	Elie Kfoury, Ali AlSabeh, Jose Gomez (UofSC)
04:50 – 05:00	Summary day 1	

# Agenda

Day 2: February 23, 2022

Time (ET) (pm)	Topic	Presenter
01:00 – 01:05	Welcome, agenda	Jorge Crichigno (UofSC), Jason Zurawski (ESnet and EPOC), James Deaton (GPN)
01:05 – 01:45	Routers, buffers, and other considerations for network performance	Hans Addleman and Brenna Meade (International Networks at Indiana University)
01:45 – 02:30	P4Campus	Hyojoon Kim (Princeton)
02:30 – 02:45	Break	
02:45 – 03:00	Tofino Pods for Teaching and Research	Jorge Crichigno (UofSC)
03:00 – 03:50	Hands-on Session 3: match-action tables; using exact matching and longest-prefix matching	Elie Kfoury, Ali AlSabeH (Uof SC)
03:50 – 04:00	Break	
04:00 – 04:50	Hands-on Session 4: populating and managing match-action tables at runtime	Ali AlSabeH, Jose Gomez (UofSC)
04:50 – 5:00	Summary	

# Lab Libraries

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- **Introduction to P4 Programmable Switches - BMv2**
- Advanced Topics on P4 Programmable Switches - BMv2
- P4 Programmable Switches - Tofino
- Network Operating Systems: ONL, SONIC, Stratum
- Software Defined Networking (SDN)
- Open vSwitch (OvS)
- Network Tools and Protocols (NTP)
- Introduction to OSPF
- Introduction to BGP
- MPLS and Advanced BGP Topics
- perfSONAR
- Zeek/Bro

See <http://ce.sc.edu/cyberinfra/cybertraining.html> for details.

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