# Formal Foundations for SDN

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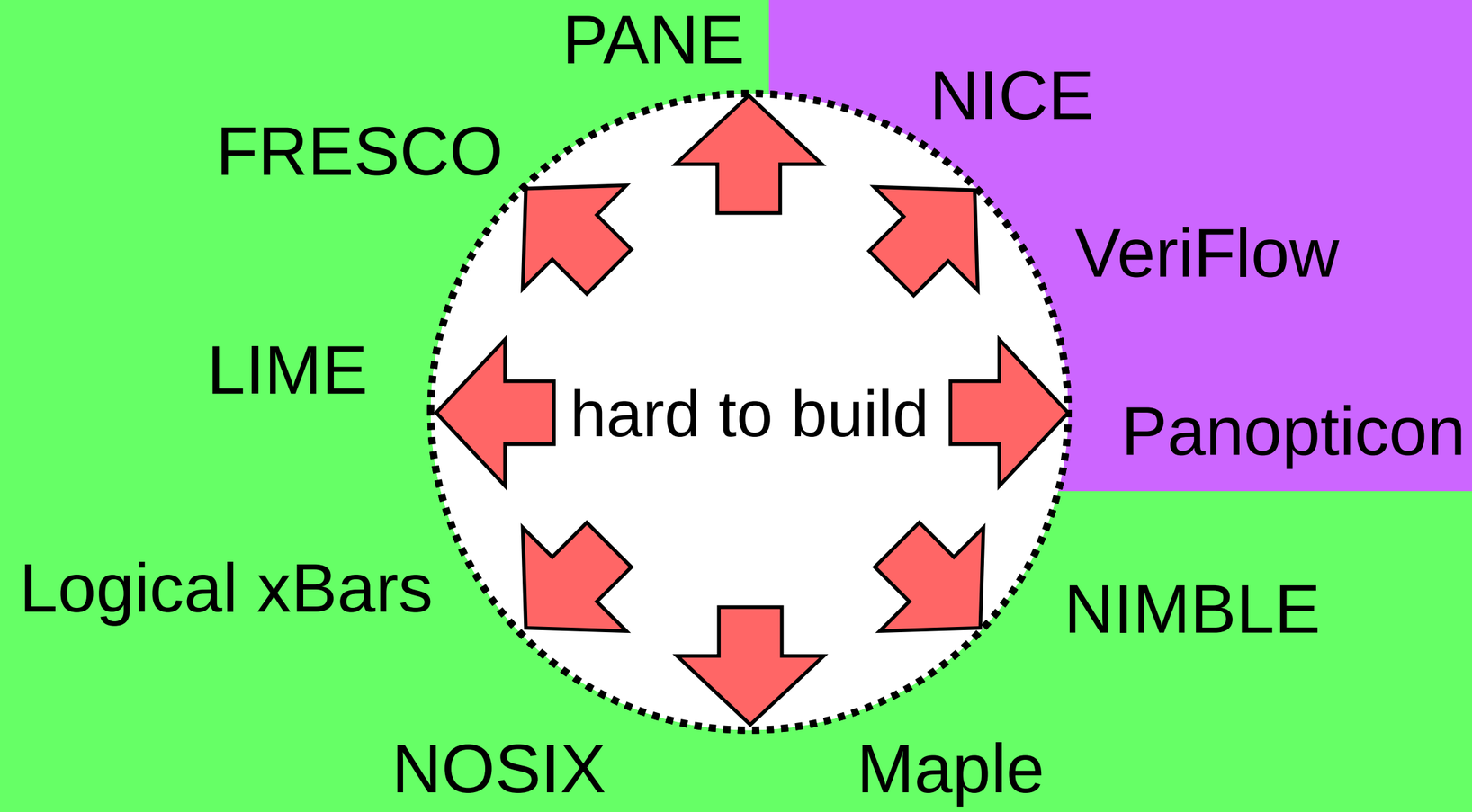
ONS 2013 Research Track

verification and analysis tools



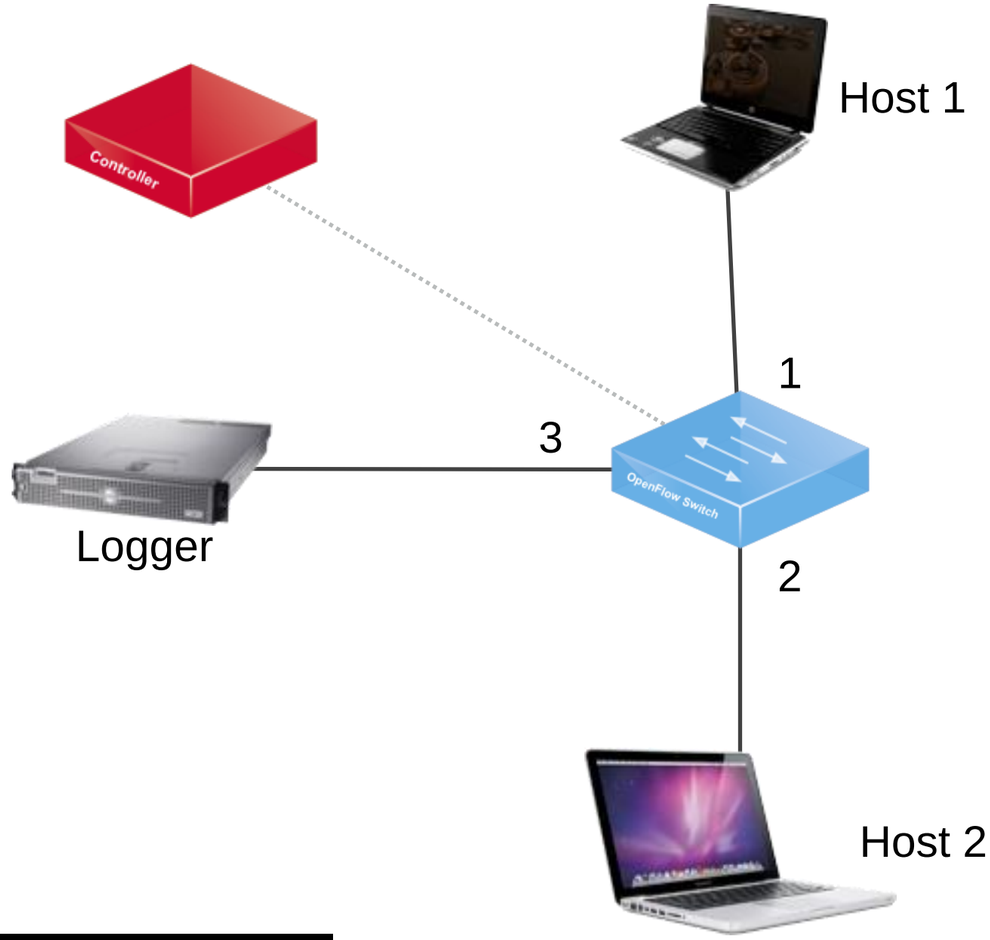

programming abstractions and
advanced controller platforms

**Security Policy**
Block SSH traffic

**Monitoring Policy**
Log HTTP requests

**Routing Policy**
Forward all other traffic
between hosts {1,2}

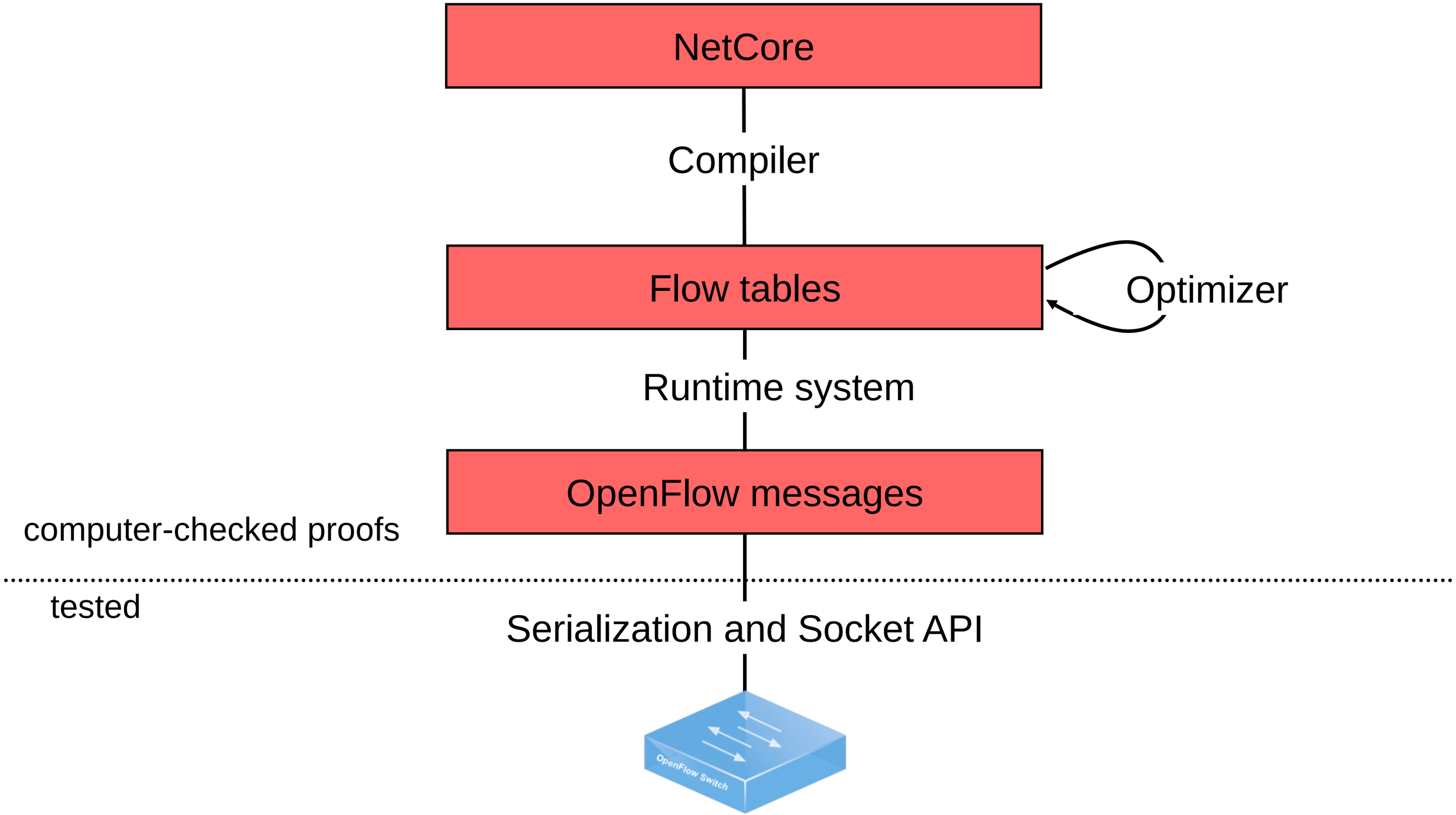
# NetCore: a high-level language for SDN programming




```
routing = dstIP == H1 => Forward 1 || dstIP == H2 => Forward 2

monitoring = dstPort == 80 => Forward 3

main = dstPort != 22 => routing || monitoring
```


NetCore
Compiler
Flow tables
Optimizer
Runtime system
OpenFlow messages
computer-checked proofs
tested
Serialization and Socket API
OpenFlow Switch


## Speakers

**Nikolaj Bjorner**
Microsoft Research
*Satisfiability Modulo Theories Solving for Network Verification*

**Brighten Godfrey**
University of Illinois at Urbana-Champaign
*Verifying Networks in Real Time*

**Timothy Griffin**
University of Cambridge
*Partial Automation in the Design and Implementation of Path-finding Algorithms*

**Arjun Guha**
University of Massachusetts Amherst
*Network Programming With Frenetic*

**Peyman Kazemian** and **Nick McKeown**
Stanford University
*Network Verification Using Header Space Analysis*

**Shriram Krishnamurthi**
Brown University
*Modeling and Reasoning about Network Components*

**Ratul Mahajan**
Microsoft Research
*Systematically Exploring the Behavior of Control Programs*

**Pamela Zave**
AT&T Research
*Compositional Abstractions of Network Architectures*