Software Defined Networking

TGI Course,
Dept. of Computer Science,
University College Cork
30th June – 4th July 2014
TGI Module Code: TGI_N11
Prof. Nick Feamster
Tiscaya LLC and Georgia Institute of Technology

This course introduces software defined networking, an emerging paradigm in computer networking that allows a logically centralized software program to control the behaviour of an entire network. Separating a network's control logic from the underlying physical routers and switches that forward traffic allows network operators to write high-level control programs that specify the behaviour of an entire network, in contrast to conventional networks, whereby network operators must codify functionality in terms of low-level device configuration.

Logically centralized network control makes it possible for operators to specify more complex tasks that involve integrating many disjoint network functions (e.g., security, resource control, prioritization) into a single control framework, allowing network operators to create more sophisticated policies, and making network configurations easier to configure, manage, troubleshoot, and debug.

Course Structure and Schedule

This course will cover 8 modules over the 5-day period. Each module will have both a lab assignment and a paper discussion, as outlined below. Some days will have two modules.

The tutorial course will cover five days and will be offered from June 30 –July 4, 2014 at the TGI Summer School. The course content will proceed as follows:

Date	Topic	Lab	Reading
June 30	Module 1: History and evolution of SDN	Virtual Box/Mininet Setup	● The Road to SDN
June 30	Module 2: Control and data plane separation	Mininet API	● Routing Control Platform ● Ethane

July 1	Module 3: Virtual networking	TBD	• Mininet
July 2	Module 4: SDN Control Plane	Hub, Switch, Firewall in POX	• NOX
July 2	Module 5: Programming SDNs	Hub, Switch Firewall in Pyretic	• Pyretic
July 3	Module 6: SDN/Programmable Data Planes	NetASM	• Forwarding Metamorphosis • P4
July 4	Module 7: Verification and Troubleshooting	IDS in Kinetic	• Kinetic
July 4	Module 8: Use Cases • Interdomain • Middleboxes	SDX Policies **Final Exam (90 Minutes)**	• SDX

Each day will focus on a particular topic. The morning session, which will be designed to run for about three hours, will include approximately a 60–90 minute lecture, followed by a discussion of each paper, based on the readings specified in the table. Paper discussion will be seeded with thought questions on each paper. Students will be able to participate in online discussions before class on an online forum such as Piazza. The afternoon session will be hands-on lab work that runs for about four hours, including time for breaks. We expect that the course will run from 9am-5pm each day.

Grading
The written exam will be worth 60% of the course grade; the remaining 40% of the grade will derive from performance on lab assignments.

**This is a 5-credit module. In order to formally pass the module, students must attend for the entire duration of the course and pass the assessment.
Note that places are strictly limited.**

TO REGISTER FOR THIS COURSE PLEASE COMPLETE FORM ON NEXT PAGE

REGISTRATION FORM
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Last Name	
First Name	
Email Address	
Institution	
Address	
Phone Number	
Current Status (eg. Student)	
Programme currently undertaking (eg. PhD etc.)	
Year	
Name of Supervisor	
Does your Supervisor approve this module registration?	Yes No
Current area(s) of research	

Email completed form to m.noonan@cs.ucc.ie
For Accommodation details, please visit https://www.uccconferencing.ie/accommodation/