

Monday June 12, 2017, Porto, Portugal

The ns-3 Consortium¹ will once again offer training on the ns-3 simulator at its June 2017 annual meeting in Porto, prior to the Workshop on ns-3. While extensive documentation is available on the public website² of the project, this single-day training session offers users the opportunity to learn from several of the lead maintainers of ns-3 about the scope and capabilities of the tools, how to run simulations, and how to write new code for ns-3.

Instructors

Sessions will be taught by several of ns-3's open source maintainers. The following are planning to lead a session:

- **Stefano Avallone.** Stefano, an Associate Professor at the University of Naples Federico II, is the architect and lead maintainer of ns-3's traffic control module, and conducts research on wireless mesh networks, MPLS traffic engineering, and intra-domain QoS routing.
- **Tom Henderson.** Tom, an Affiliate Professor at the University of Washington, is an ns-3 project founder and lead maintainer of the open source project, and has been active with ns-2 and ns-3 for twenty years.
- **Tommaso Pecorella.** Tommaso, an Assistant Professor at the University of Florence, is one of the most active maintainers across several Internet-related modules, and answers many questions on a daily basis from ns-3 users in the Google Groups forum.
- **Mohit P. Tahlilani.** Mohit, an Assistant Professor at NITK Surathkal, has been supervising many ns-3 related student projects on the top-ics of TCP, Active Queue Management (AQM) and Explicit Congestion Notification.

Topics

The single day of training will be organized around the basic simulator on Monday morning and more advanced topics and extensions on Monday afternoon. We will possibly break into two or three parallel sessions for Monday afternoon topics, depending on participant interest. We will reserve a portion each session for Q&A, allowing deeper treatment of topics of particular interest.

Monday June 12 morning	Monday June 12 afternoon
<ul style="list-style-type: none">• ns-3 survey and overview tutorial, starting from first principles and walking through the running of simulations, configuration management, data output and visualization, architecture of the software core, Internet protocols, network emulation, and development practices using ns-3.• Methodology and workflow for developing new models in ns-3, using a case study.	<ul style="list-style-type: none">• A survey of wireless-related models in ns-3, with emphasis on Wi-Fi and LTE, and covering mobility and propagation models.• A tutorial on TCP simulations with ns-3, with an overview of TCP architecture, implementation of congestion control and loss recovery algorithms, example simulations, trace analysis and testing.• A tutorial on the internals of the traffic control module and on the configuration and usage of queuing disciplines with ns-3.

Prerequisites

Basic proficiency in C++ programming is considered a prerequisite for working with ns-3. A basic understanding of computer networking protocols and technology such as TCP/IP, and wireless and wired models (e.g. Ethernet, Wi-Fi, and LTE) is also assumed. Python or bash programming skills may also be helpful but are not required.

Participants will be shown how to compile, test, and debug programs using the Linux operating system and the GNU Compiler Collection (gcc). A basic capability to run programs from the Linux or Mac OS X command line is

¹ <http://www.nsnam.org/consortium/about>

² <http://www.nsnam.org>

strongly recommended. The training will be conducted with a mix of Linux and OS X (depending on speaker preference).

Schedule

Training will run from 09h00-18h00 on Monday, with a morning and afternoon coffee break and a lunch break. ns-3 training covers the first day of a three-day event schedule, and attendees are welcome to attend other events later in the week. On Tuesday, the ninth annual Workshop on ns-3, in cooperation with ICST and EAI, and the ACM, will be held; this single-track workshop will feature original research papers regarding the design and performance of ns-3 software. On Wednesday afternoon, the ns-3 Consortium Annual Plenary will be held after WNS3 concludes; this open meeting is for review of the status and future plans of the open source project. There are no events scheduled on Thursday June 15 due to a national holiday in Portugal. Some developer activities (ns-3-related meetings or possibly a coding sprint) may take place on Friday June 16; contact Tom Henderson if interested to attend. The three-day meeting schedule and cost structure is shown below.

Monday June 12	Tuesday June 13	Wednesday June 14
ns-3 Training	Workshop on ns-3 (WNS3)	Workshop on ns-3 (continued) ns-3 Consortium Annual Plenary
\$500/\$250/\$50 for industry/academic/student attendees	\$250/\$150/\$50 for industry/academic/student attendees	Consortium meeting is free of charge

Materials

A bootable Live-CD for an Intel x86 architecture, with ns-3 and related software pre-installed, will be provided. This can be run inside a virtual machine or native on x86-compatible laptops. However, attendees are encouraged to download and build ns-3 on their machine of choice prior to the workshop, and to review the online tutorial.

All other materials will be provided via the Internet. Guest WiFi access will be available to attendees.

Cost

The training is offered for \$500 USD/day for one day for attendees from private industry, \$250 USD for attendees from academic, government, or other non-profit organizations, and \$50 USD for students who meet the criteria for IEEE student membership (carrying at least 50% of a normal full-time academic program as a registered undergraduate or graduate student). Students are asked to bring documentation verifying student status. If you must cancel, please do so by Friday June 9, to receive a full refund.

All proceeds will be deposited to the NS-3 Consortium gift account at the University of Washington, to support the open source project activities.

Local Information

WNS3 and the associated events will take place at the Faculty of Engineering, University of Porto (FEUP), Porto, Portugal. Directions on how to get to the meeting, on local arrangements, and regarding visas can be found online.³

Meals

Coffee services (morning and afternoon) and a lunch at the FEUP canteen will be provided.

Registration

Registration must be made with a credit card at the following page: <http://ns3-annual-2017.eventzilla.net>. Registration must be paid in full prior to attending the first session. To allow for proper planning, all attendees are requested to register by one week prior to the event, or to contact the organizers if within the one-week window.

³ <http://www.nsnam.org/overview/wns3/wns3-2017/local-information/>