ns-3 Training

May 11-12, 2015, Castelldefels (Barcelona), Spain

Join us for the third annual meeting of the NS-3 Consortium[1] in May 2015, including, for the second time, two days of user training with the simulator and its associated tools.   ns-3 is a popular open-source, discrete-event network simulator designed for Internet research. While extensive documentation is available on the public website[2] of the project, this course offers users the opportunity to learn from experts 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:

- **Nicola Baldo.** Nicola is a Senior Researcher at the Centre Tecnològic de Telecomunicacions de Catalunya (CTTC); he presently serves as the lead ns-3 LTE maintainer, has served as the ns-3 WiFi maintainer, and has contributed to ns-2 and ns-3 for several years.

- **Peter D. Barnes, Jr**. A scientist at Lawrence Livermore National Laboratory, Peter actively contributes to the ns-3 software core and documentation, and has created million-node network simulations.

- **Tom Henderson.** Tom, an Affiliate Professor at the University of Washington, is an ns-3 project founder and leader of the open source project, with many years of ns-2 and ns-3 experience.

- **Konstantinos Katsaros.** Konstantinos is a Research student at the Institute for Communications Systems, University of Surrey, and uses ns-3 for vehicular networking research. Konstantinos is consistently the top poster (helping other users with ns-3 questions) on the ns-3-users mailing list.

- **Hajime Tazaki.** Hajime, a Project Lecturer at the University of Tokyo, is the lead maintainer of the Direct Code Execution environment for ns-3 and has published several technical papers on its operation.

Topics

The two days of training will be organized around the basic simulator on Monday and more advanced topics and extensions on Tuesday. We will reserve a portion each day for interactive Q&A and guidance from the instructors, allowing deeper treatment of topics of particular interest.

Monday May 11	Tuesday May 12
ns-3 survey and overview tutorial, starting from first principles and walking through the running of simulations, configuration management, architecture of the software core, network emulation, and development practices using ns-3. - Methodology and workflow for **developing new models in ns-3**, using a case study. - Several tools used to **extract and visualize data** from ns-3 simulations, including the flow monitor, network animator NetAnim, Python-based visualizer, and the ns-3 tracing system.	- A tutorial on **vehicular communication simulations**, including mobility, WiFi and WAVE models, and propagation. - A survey of the **LTE** models, including model architecture, propagation models, LTE Radio Protocol Stack and EPC model. **Large-scale, distributed simulations** with ns-3. - An introduction to the **Direct Code Execution (DCE)** environment, enabling users to use real application and Linux networking code in 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, WiFi, and LTE) is also assumed. Python programming skills are also helpful.

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[1] http://www.nsnam.org/consortium/about

[2] http://www.nsnam.org

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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 command line is strongly recommended. A Microsoft Visual Studio 2012 environment is available, but the training will be conducted with Linux.

Schedule

Training sessions will run from 09h00-18h00 each day, with a morning and afternoon break and a lunch break. ns-3 training covers the first two days of a week-long event schedule, and attendees are welcome to attend other events later in the week. On Wednesday, the sixth 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 Thursday, the ns-3 Consortium Annual Plenary will be held in the morning, and the balance of the week will be reserved for ns-3 developer discussions and coding sprints. Attendance is free and open on the latter two days of the week.

Monday May 11	Tuesday May 12	Wednesday May 13	Thursday May 14	Friday May 15
ns-3 Training	ns-3 Training	Workshop on ns-3	NS-3 Consortium Annual Meeting Developer meetings	Developer meetings
$500 per day; free for students	$500 per day; free for students	$100; free for students	Free	Free

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.

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 two days ($1000 total). Training is provided free 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 May 8, 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 be held at CTTC, Av. Carl Friedrich Gauss 7, 08860 Castelldefels (Barcelona), Spain. Directions on how to get to the meeting, on local arrangements, and regarding visas can be found online.[3]

Meals

Coffee service will be provided. Attendees are responsible for all meals; the course location is local to a number of restaurants within walking distance.

Registration

Registration must be made with a credit card at the following page: http://ns3-annual-2015.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 weeks prior to the event, or to contact the organizers if within the one-week window.

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[3] http://www.nsnam.org/overview/wns3/wns3-2015/local-information/