NS-3 Consortium
2014 Annual Operational and Financial Report

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2014 Executive Director

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1. Introduction

In accordance with Article 3 of the NS-3 Consortium Establishment Agreement, the Steering Committee is chartered with producing an annual operational and financial report with a brief scientific and technical overview. This report constitutes the annual report for 2014.

This report is organized as follows:

- Section 2 describes the purpose and general objectives of the NS-3 Consortium.

- Section 3 lists the consortium members and committee composition for 2014.

- Section 4 summarizes the 2014 meetings of the NS-3 Consortium.

- Section 5 provides a brief technical overview of the activities of the open source ns-3 project.

- Section 6 provides the annual financial report of the Consortium.

- Section 7 lists future plans for the Consortium.

2. Purpose and General Organization of the NS-3 Consortium

The NS-3 Consortium was established in its present form in October 2012, by two founding members: the University of Washington and INRIA. The Consortium was established to provide a long-running organization to support the open source ns-3 network simulator project. This support comes in two primary forms:

1) an organization to raise and manage funding needed to operate the open source project

2) a steering committee to assist in operational and logistical functions in support of the open source project

The Consortium operates according to the rules documented in the NS-3 Consortium Establishment Agreement formed by the University of Washington and INRIA. The organization structure is loosely patterned after other consortia previously formed by both institutions, and drawing also from other open source foundations and consortia supporting other open source projects.

Membership is composed of institutions that have some kind of interest in maintaining and developing the ns-3 network simulator. Membership is one way that an organization can financially or operationally support the project. There are two main tiers of membership: 1) Executive Members, who provide management, and 2) regular Consortium Members, who pay annual dues and who can participate in annual Consortium activities.

The Steering Committee is the main operational body within the consortium, and is responsible for the following main duties (Article 3 of the Consortium Establishment Agreement documents some additional duties):

- making recommendations on how the Consortium's funds shall be expended, accordingly with its objectives (organization of training courses, workshops, etc.),
- organizing events in relation to the NS-3 Consortium,
- accepting new members,
- submitting suggestions made by Consortium Members to ns-3 maintainers.

The Steering Committee is composed of representatives of its Executive Members. The Steering Committee is chaired by an Executive Director who is appointed annually by the Steering Committee.

Further details are available in the NS-3 Consortium Establishment Agreement document, available online at http://www.nsnam.org/consortium.

3. Membership

There were no membership or leadership changes during 2014. The Steering Committee, at the end of 2014, consists of:

- Nicola Baldo (CTTC)

- Marc Barret (INRIA)

- Mike Clarke (University of Washington)

- Walid Dabbous (INRIA)

- Gerard Giraudon (INRIA)

- Tom Henderson (University of Washington)

- L. Felipe Perrone (Bucknell University)

- Manuel Ricardo (INESC Porto)

- George Riley (Georgia Institute of Technology)

- Sumit Roy (University of Washington)

Tom Henderson served as Executive Director in 2013 and 2014 and was reappointed to another annual term in October 2014.

In July 2013, Lawrence Livermore National Laboratory (United States) joined as a regular Consortium Member, and at the end of 2014, continues to be the only such member.

4. Meetings

The steering committee met four times (in February, May, September, and October) in 2014. Detailed meeting notes are available on the main ns-3 web server.

The first meeting on February 14, 2014 accomplished the following:

- approval of 2013 operational/financial report, and posting of the report and steering committee meeting minutes to the project website; and

- planning for the annual Workshop on ns-3 in Atlanta in May, including planning for ns-3 training and management of projected costs and revenue from the event.

The ns-3 Consortium Annual Meeting was hosted by Georgia Tech on May 8, 2014, and attended by thirteen people. The agenda of the meeting was to review the goals of the consortium, review 2013-14 activities, and discuss next steps. The meeting was open to all interested participants. Tom Henderson presented a set of overview slides, and discussion was held on selected topics:

- how to make available the videos recorded in the ns-3 training session;
- how to recruit new software maintainers, and what to do with unmaintained modules;
- scope of Workshop on ns-3 Call for Papers, and ideas for boosting attendance;
- Google Summer of Code planning; and
- how to better reach out to potential industrial members.

On September 16, 2014, the steering committee held a telecon to discuss these items:

- outcomes of the 2014 Google Summer of Code and ESA Summer of Code in Space projects;

- problems with the web server infrastructure, and plan to address the problems with new hardware at Georgia Tech and additional backup capability at the University of Washington;

- consortium membership;

- reappointment of an Executive Director for 2015; and

- initial planning for the 2015 edition of Workshop on ns-3, confirmation of the site of Barcelona (to be hosted by CTTC), and selection of technical program committee chairs.

The final steering committee telecon of 2014 was held on October 10, 2014, to address the following agenda items:

- confirmation of WNS3 technical program committee co-chairs;

- selection of the week (11 May 2015) to hold the Workshop on ns-3 and training sessions;

- search for a proceedings chair for the workshop;

- reappointment of Tom Henderson as Executive Director for 2015;

- possible training opportunities for the U.S in early 2015; and

- approval of expenses for project infrastructure.

5. Technical Overview of 2014 Activities

This section provides a brief overview of 2014 activities of the open source ns-3 project. The NS-3 Consortium did not directly fund any of these activities; if it were to fund activities in future years, based on Consortium funds, those results would be reported in this section of the annual report.

The main activities were the two scheduled software releases of ns-3, ns-3.20 and ns-3.21, including new model features and bug fixes. In general, the project makes roughly three software releases per year, but in 2014, only two were made, since a release was made just prior to 2014 (in December 2013) and one is scheduled for January or February 2015.

ns-3.20 was released on 17 June 2014. This release featured a new low-rate, wireless personal area network (LR-WPAN) model providing initial support for IEEE 802.15.4 networks, and integration with the previously released SixLowPan (6LoWPAN) module. A new IPv6 routing protocol (RIPng) model was added, and support within the Flow Monitor for IPv6 was also added. A new LTE MAC downlink scheduling algorithm named Channel and QoS Aware (CQA) Scheduler was provided by the new CqaFfMacScheduler object

ns-3.21 was released on 17 September 2014 and the Direct Code Execution (DCE) version 1.4 release on the following day. For ns-3, several modules were extended. The LTE module now supports Frequency Reuse algorithms, and also supports the transport of the S1-U, X2-U and X2-C interfaces over emulated links in real-time emulation mode. The Internet module includes new support for a CoDel queue model and support for TCP Timestamps and Window Scale options. Improvements to the energy modeling of Wifi (sleep mode) and a general energy harvesting model were added. In the network module, a new Packet Socket application and helper were added, and the SimpleNetDevice and channel models extended, to facilitate traffic generation and protocol testing without a dependence on the Internet module. Among the new features of DCE version 1.4 are a simple bash example illustrating how to make shell script run within a simulation, and a Dockerfile and image for installation with the Docker software container framework.

The project mentored four summer students in 2014 as part of the Google Summer of Code program, and one student in the European Space Agency "Summer of Code in Space" project. ns-3 has participated in Google Summer of Code in every year but one since 2008.

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6. Financial Report

The Consortium funds are presently maintained by the University of Washington.

The following income was received in 2014:

- All Google Summer of Code mentors (Tom Henderson, Tommaso Pecorella, Nicola Baldo, Marco Miozzo, and Dave Taht) agreed to donate the "mentor stipends" received from Google ($500 for each student project) to the Consortium;
- The project received income from registration fees for WNS3 training and attendance.

The following expenses were incurred in 2014:

- Gifts (project shirts, speaker gifts) for presentation at the May 2014 annual meeting;
- Project shirts for 2014 summer students and mentors;
- Paypal and Eventzilla fees for handling workshop payments;
- Beverage/food costs for WNS3;
- Vimeo hosting costs for ns-3 training videos;
- Miscellaneous equipment, hardware, and software (speakerphone, hard drive, Vmware Fusion)
- Miscellaneous expenses (postal fees, photocopying)
- SSL certificate for the server www.nsnam.org;
- Travel grant for attending the ns-3 workshop and developer meetings.

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7. Future Plans

In 2015, the Consortium plans to hold a similar, week-long event in Barcelona in May (the week of 11-15 May), hosted by CTTC. The first two days will consist of user training, requiring paid registration for non-students. Proceeds from the registration fees will be donated to the Consortium. The seventh annual Workshop on ns-3 will be held on the third day (Wednesday May 13). The fourth and fifth days will be reserved for the ns-3 Consortium annual meeting, developer discussions, and coding and documentation work.

The Consortium will likely conduct training and other activities in the United States in 2015, at a date and site to be determined.

Finally, a key goal of the open source project for 2015 is to further modularize the codebase. This is to allow a more federated development and software maintenance model that does not require that all models be merged into the main ns-3 source tree. The current list of models under development and undergoing code review is maintained on the "Current Development" wiki page on the ns-3 wiki.