Panel Discussion: Simulating power consumption in OMNeT++

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Abstract—**A panel discussion on simulating power consumption was organized for the OMNeT++ Summit. Six speakers are scheduled to discuss their experiences and thoughts for the future.**

Energy efficiency has become an important performance metric for an increasingly wide range of systems – from networks of small battery-powered radios that consume only a few mW of power to large data centers that can consume a MW or more. Unsurprisingly, models of energy sources and power consumption have been developed for a wide range of OMNeT++-based simulators.

This panel discussion is intended to highlight the state-of-the-art, as well as some of the main issues around simulating power consumption in OMNeT++. One goal of this session is to stimulate further discussion within the community about how OMNeT++ can better support this important functionality and to encourage collaboration among researchers and developers.

Six speakers are currently scheduled to participate in the panel. Several of them have also provided Invited Abstracts, which are included in the Summit proceedings:

Saeed Bastani, Lund University

Content Delivery Networks (CDNs) are becoming an integral part of the future generation Internet. Traditionally, these networks have been designed with the goals of traffic offload and the improvement of users' quality of experience (QoE), but the energy consumption is also becoming an indispensable design factor for CDNs to be a sustainable solution. To study and improve the CDN architectures using this new design metric, we are planning to develop a generic and flexible simulation package in OMNet++. This package is aimed to render a holistic view about the CDN energy consumption behaviour by incorporating the state-of-the-art energy consumption models proposed for the individual elements of CDNs (e.g. servers, routers, wired and wireless links, wireless devices, etc.) and for the various Internet contents (web pages, files, streaming video, etc.).

Saeed Bastani is a post-doctoral researcher at Lund University.

Torsten Braun, University of Bern

Our work addresses issues with state-based energy-consumption modeling: Energy consumption is usually modeled by a state based approach with constant energy consumption values in each state. However, it happens in certain situations that during state changes or even during a state the energy consumption is not constant. We will present some examples for such cases and possible solutions.

Torsten Braun is a professor at the University of Bern.

Radu Carpa, ENS Lyon

I seek to reduce the energy consumption of the networks while maintaining a high level of quality of service. I focus on backbone and inter-datacenter networks and use intelligent and increase its energy efficiency.

Radu Carpa is a PhD student under the supervision of Laurent Lefèvre and Olivier Glück at LIP laboratory - Avalon Inria team - ENS Lyon.

Laura Marie Feeney, SICS/Uppsala University

The EnergyFramework provides abstractions for simulating energy consuming device components and an energy store, as well as statistics collection. The goal of this structure was to make it possible to incorporate power consumption modeling into a wide range of simulation models. It was partly successful: EnergyFramework has been ported to several wireless network frameworks, most notably MiXiM and its descendants. We consider lessons learned and possible directions for development of a more general, flexible and easily integrated structure.

Laura Marie Feeney is a researcher at the Swedish Institute of Computer Science and Uppsala University.

Sei Ping Lau, University of Southampton Sei Ping Lau is working on enabling energy savings in networked streetlights with StreetlightSim, a simulation environment based on OMNeT++.

Sei Ping Lau is at the University of Southampton.

Dora Spenza, University of Rome – La Sapienza

GreenCastalia is an open-source extension to the Castalia simulator for energy-harvesting Wireless Sensor Networks. GreenCastalia supports multi-source and multi-storage energy-harvesting architectures and it allows to simulate networks of embedded devices with heterogeneous harvesting capabilities.

Dora Spenza is a post-doctoral researcher at the University of Rome, La Sapienza.