

Title of the subject: Performance Analysis of ICT systems

Credits: 4

Name of the relevant lecturer: Dr. Gábor Lencse

Aim of the subject:

- introduction to the methods for performance analysis of ICT systems
- presentation of some particular solutions, methods, results of the field as motivating examples
- get acquainted with a specific modelling and simulation environment (OMNeT++)
- some aspects of IETF standards, and the process of writing/reviewing/accepting IETF documents demonstrated on an example of a relevant Internet Draft

Topics:

1. Introduction to the methods for performance analysis of ICT systems. The fundamentals and terminology of modelling and simulation. Methods and tricks for presenting results. Case study: performance analysis of DNS64 and NAT64 implementations by measurements.

2. Synchronisation methods for parallel discrete-event simulation (PDES). The statistical synchronisation method with loose synchronisation. The traffic-flow analysis (TFA) method. Combination of the methods, possible solutions for speeding up.

3. Introduction to the OMNeT++ discrete-event modelling and simulation framework. OMNeT++ architecture. Model building and experimenting in OMNeT++. Demonstration of the OMNeT++ GUI. Case study: presentation of a research carried out using OMNeT++.

4. Terminology and methods of IETF RFCs about benchmarking of network interconnect devices (RFC 2544, RFC 5180). The IETF standardization process. Case study: the Internet Draft "Benchmarking Methodology for IPv6 Transition Technologies": its milestones, main content, and peculiarly the method for benchmarking DNS64 servers (which is a contribution of the lecturer of this doctoral school subject).

Homeworks: (optional)

The students may request an individually assigned task from the following topics:

- OMNeT++: building an own model, experimenting with it and evaluating the results.
- Benchmarking and/or modelling the performance of one or more implementations of a particular IPv6 transition technology (e.g. DNS64, NAT64).

Mark: primarily exams. Optionally on the basis of home assignments. Conditions for this opportunity: the student must attend all the lectures and prepare the home task in good quality.

Compulsory literature:

- The presentation slides of the lectures.
- Documents on the home page of the subject denoted as "compulsory"

Recommended literature:

- Documents and links on the home page of the subject not denoted as "compulsory"...