Distributed Systems Group
Delft University of Technology
Mekelweg 4, 2628CD Delft, the Netherlands

1-page Annual Report 2015

Today, distributed systems are the rule rather than the exception—it is almost impossible to point at any two computers in the world that are not connected in some way. Virtually all application areas, from health care to entertainment, and from industrial automation to traffic management, rely on distributed systems. Responding to challenges in this field, our mission is to model, design, implement, and analyze distributed systems and algorithms.

This is a brief, and first, annual report of the Distributed Systems (DS) Group of Delft University of Technology, for the year 2015. It is meant to present the main changes and achievements of the DS group to other groups in the faculty, to our previous master's and PhD students, to our research partners, and to anyone who might be interested in a collaboration.

CURRENT STAFF
Dick Epema, full professor (chair)
Alexandru Iosup, associate professor
Johan Pouwelse, associate professor
Henk Sips, full professor
Ana Lucia Varbanescu, assistant professor (guest)
Otto Visser, education innovator
Nicola Zannone, assistant professor (guest)

CHANGES IN STAFF IN 2015
- Dick Epema was appointed full professor
- Alexandru Iosup was appointed associate professor
- Otto Visser was appointed education innovator

PHD DEFENSES IN 2015
- Siqi Shen, *Massivizing Networked Virtual Environments on Clouds* (Dick Epema, promotor, Alexandru Iosup, co-promotor)
- Niels Zeilemaker, *Privacy and Cooperation in Peer-to-Peer Systems* (Henk Sips, promotor, Johan Pouwelse, co-promotor)
- Mihai Capotă, *User Contribution in Peer-to-Peer Communities* (Dick Epema, promotor, Johan Pouwelse, co-promotor)
- Jie Shen, *Efficient High Performance Computing on Heterogeneous Platforms* (Henk Sips, promotor, Ana Varbanescu, co-promotor)

AWARDS IN 2015
- Alex Iosup won the title "Dutch Teacher of the Year in Higher Education 2015"
- Team won ACM NETGAMES 2015 Best Paper Award

OTHER HIGHLIGHTS IN 2015
- Alex Iosup was appointed as a member of the Jonge Akademie (the junior section of the Royal Dutch Academy of Sciences)
- Johan Pouwelse gave a keynote at the *IEEE Conference on Peer-to-Peer Computing*

MAIN INDUSTRY COLLABORATION IN 2015
- NL: Solvinity, Azavista, etc.
- International: Oracle, Intel, SPEC, LDBC, etc.

SELECTED RESEARCH ACHIEVEMENTS IN 2015

Big-Data Processing:
- Design of LDBC Graphalytics, a benchmark for graph-processing platforms
- Detection of toxicity and analysis of other types of social gaming relationships using big data mining techniques

Scheduling:
- Design and analysis of scheduling policies for Hadoop, to reduce slowdown variability for different jobs sizes
- An analysis of the benefit of knowing task runtimes when scheduling a workload of workflows
- A mechanism for managing, and a portfolio scheduling system for Availability-on-Demand in datacenters
- A portfolio scheduler and a self-expressive system for managing business-critical workloads in datacenters
- A characterization of business-critical workloads in datacenters

Cooperative Systems:
- Creation of a tamper-resistant datastructure to store proof-of-work records using scalable graphs
- Launch of a self-compiling smartphone app capable of mutation and viral spreading
- Development of a proof-of-principle for a fully decentralized market for cybercurrency, complete with a fast limit-order book

MAIN PUBLICATIONS IN 2015
- van Beek et al., "Self-Expressive Management of Business-Critical Workloads in Virtualized Datacenters," *IEEE Computer* 48(7)
- Ghit et al., "Reducing Job Slowdown Variability for Data-Intensive Workloads," *MASCOTS*
- Gkorou et al., "Trust-based collection of information in distributed reputation networks," *SAC*
- Guo et al., "An Emperical Performance Evaluation of GPU-Enabled Graph-Processing Systems," *CCGrid*
- Jia et al., "Estimating user interaction strength in distributed online networks," *CCPE* 27(17)
- Jia et al., "Socializing by Gaming: Revealing Social Relationships in Multiplayer Online Games," *TKDD* 10(2)
- Shen et al., "Area of Simulation: Mechanism and Architecture for Multi-Avatar Virtual Environments," *ACM ToMM* 12(1)