

# SIGOPS Annual Report 2008

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Fiscal Year July 2007-June 2008

Submitted by Doug Terry, SIGOPS Chair

## Overview

SIGOPS continues to be a vibrant community of people with interests in “operating systems” in the broadest sense, including topics such as distributed computing, storage systems, security, concurrency, middleware, mobility, virtualization, networking, datacenter software, and Internet services. We sponsor a number of top conferences, provide travel grants to students, present yearly awards, disseminate timely information, and collaborate with other SIGs on important programs for computing professionals.

Highlights from the past year include:

- New officers were elected and started their duties on July 1: Doug Terry as Chair, Frank Bellosa as Vice Chair, and Jeanna Matthews as Treasurer and Editor of our newsletter. Stefan Saroiu was appointed as the new Information Director.
- SOSP, our flagship conference, was held in Stevenson, Washington, on October 14-17. A Women’s Workshop was held in conjunction with SOSP, thereby significantly increasing the representation of women at the conference.
- A list of the significant events in SIGOPS’s history, dating back to its origins in 1965, was compiled with help from the ACM History Committee and Fran Spinola, our ACM program manager.
- The SIGOPS membership benefits and dues structure were revised to offer printed proceedings as an option, which should substantially reduce the amount of paper that we print and mail in future years.
- The SIGOPS web site, <http://www.sigops.org/>, was drastically redesigned.

## Awards

SIGOPS presents several awards on a yearly basis, and here are this past year’s recipients:

- The Mark Weiser Award, for creativity and innovation in operating systems research, was presented at SOSP to Peter Chen.
- The Edsger W. Dijkstra Prize in Distributed Computing was presented at PODC to Baruch Awerbuch and David Peleg for their paper on “Sparse Partitions”, published in the *Proceedings of the 31st Annual Symposium on Foundations of Computer Science (FOCS)*, 503-513, October 1990.
- The SIGOPS Hall of Fame Award, which recognizes the most influential systems papers, was presented at SOSP to five papers:

- Leslie Lamport, “Time, Clocks, and the Ordering of Events in a Distributed System,” *Communications of the ACM* 21(7):558-565, July 1978.
- Andrew D. Birrell and Bruce Jay Nelson, “Implementing Remote Procedure Calls,” *ACM Transactions on Computer Systems* 2(1):39-59, February 1984.
- Jerome H. Saltzer, David P. Reed, and David D. Clark, “End-To-End Arguments in System Design,” *ACM Transactions on Computer Systems* 2(4):277-288, November 1984.
- Michael Burrows, Martin Abadi, and Roger Needham, “A Logic of Authentication,” *ACM Transactions on Computer Systems* 8(1):18-36, February 1990.
- Fred B. Schneider, “Implementing Fault-Tolerant Services Using the State Machine Approach: A Tutorial,” *ACM Computing Surveys* 22(4):299-319, December 1990.

## Significant Papers

The following papers from the last SOSP exemplify the breadth and quality of research being done in the SIGOPS community. Three of these papers were selected as SOSP award papers and suggested for publication in ACM TOCS, and all four were recommended (and two have been accepted) for the new Research Highlights section of CACM.

- Marcos K. Aguilera, Arif Merchant, Mehul Shah, Alistair Veitch, and Christos Karamanolis, “Sinfonia: A New Paradigm for Building Scalable Distributed Systems”.

*Building scalable distributed infrastructure services within a data center is a hot topic in the systems community. This paper combines known distributed systems techniques with new abstractions, such as mini-transactions, to provide building blocks for rapid service deployment.*

- Stephen Chong, Jed Liu, Andrew C. Myers, Xin Qi, Krishnaprasad Vikram, Lantian Zheng, and Xin Zheng, “Secure Web Applications via Automatic Partitioning”.

*Designing web applications for both security and performance is notoriously difficult. This paper proposes a novel approach in which the compiler, based on stated policies, automatically partitions a program into server-side and client-side components and synthesizes a custom protocol for client-server communication. Thus, the resulting web application is “secure by construction”.*

- Ramakrishna Kotla, Lorenzo Alvisi, Mike Dahlin, Allen Clement, and Edmund Wong, “Zyzyva: Speculative Byzantine Fault Tolerance”.

*Although the theoretical computer systems community designed protocols many years ago for reaching agreement in the presence of arbitrary (i.e. “Byzantine”) faults, these protocols were largely ignored by the experimental systems community, mostly due to their cost and complexity. Recently, there has been a flurry of research activity to develop practical protocols for Byzantine fault tolerance. This paper shows that speculative execution, where clients and servers optimistically proceed as though messages arrive in order and are sent by trustworthy nodes,*

*can reduce the latency and number of messages in a BFT protocol, resulting in a protocol that may in fact be efficient enough to be adopted by real systems.*

- Christopher J. Rossbach, Owen S. Hofmann, Donald E. Porter, Hany E. Ramadan, Aditya Bhandari, and Emmett Witchel, “TxLinux: Using and Managing Hardware Transactional Memory in the Operating System”.

*Transactional memory is being explored as a new programming abstraction for parallel processing. This paper discusses the use of hardware transactional memory in the Linux operating system including scheduling issues and the cooperation between locks and transactions.*

## Programs and Services

This year, we reduced professional SIGOPS membership dues to \$15 and student membership to just \$5 per year. We will offer a “member plus” package (for \$20) for those who wish to continue receiving printed conference proceedings.

Several widely respected conferences were sponsored or co-sponsored by SIGOPS this year. The *Twenty-sixth Symposium on Principles of Distributed Computing (PODC)*, co-sponsored with SIGACT, was held August 12-15 in Portland, Oregon. The *Twenty-first Symposium on Operating Systems Principles (SOSP)* was held October 14-17 in Stevenson, Washington. The *Fifth International Conference on Embedded Networked Sensor Systems (SenSys)*, co-sponsored with SIGCOMM, SIGARCH, SIGBED, SIGMOBILE, and SIGMETRICS, was held November 6-9 in Sydney, Australia. The *Thirteenth International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, co-sponsored with SIGARCH and SIGPLAN, was held March 1-5 in Seattle, Washington. The *Fourth International Conference on Virtual Execution Environments (VEE)* was held March 5-7 in Seattle as well. The *Third EuroSys Conference* was held March 31-April 4 in Glasgow, Scotland.

SIGOPS encourages participation in conferences and career building activities for young members of the community. For example, over 100 travel grants were provided this year for students to attend the SOSP conference and the associated Women’s workshop, with many of these grants targeted at women and underrepresented minorities. As another example, a shadow program committee for SOSP was run under the sponsorship of our European chapter to give post docs and new faculty members experience participating on a PC.

SIGOPS also publishes a quarterly newsletter, *Operating Systems Review*, which focuses on specific research topics or research institutions, manages an electronic mailing list, which is used for announcements, and maintains a web site.

## Key Issues

Like other SIGs, SIGOPS faces the issue of membership retainment and growth. Several activities are underway. One is providing travel grants to conferences so that students can experience the benefits of

belonging to the SIGOPS community. Another is providing the opportunity for members of our European chapter to automatically become SIGOPS members through a joint registration process. Third, as mentioned above, we have reduced the yearly membership dues.

Another issue of importance is global outreach. A few years ago, SIGOPS started a yearly systems conference in Europe called EuroSys, which has developed a good reputation and is doing well. In the next few years, we hope to explore initiating or holding conferences in other parts of the world, particularly Asia and South America.