



7th USENIX Symposium  
on Operating Systems  
Design and Implementation



Nov. 6-8, 2006,  
Seattle, WA

Sponsored by USENIX,  
The Advanced Computing  
Systems Association,  
in cooperation with  
ACM SIGOPS

*Join us* in Seattle, WA, November 6-8, 2006, for innovative, exciting work in the systems area. The 7th USENIX Symposium on Operating Systems Design and Implementation (OSDI '06) brings together professionals from academic and industrial backgrounds in what has become a premier forum for discussing the design, implementation, and implications of systems software. The OSDI Symposium emphasizes both innovative research and quantified or illuminating experience.

OSDI '06 is co-located with the 3rd Workshop on Real, Large Distributed Systems (WORLDS '06), which will take place on November 5. The Second Workshop on Hot Topics in System Dependability (HotDep '06) will be held on November 8, immediately following OSDI '06. See <http://www.usenix.org/events> for details.

## REGISTRATION / HOTEL

### TECHNICAL SESSION REGISTRATION FEES

Member: \$825  
Nonmember: \$960\*  
Full-time Student Member: \$290  
Full-time Student Nonmember: \$330\*

#### Early Bird Rates. Deadline is October 16.

Member: \$675  
Nonmember: \$810\*  
Full-time Student Member: \$290  
Full-time Student Nonmember: \$330\*

\*Nonmember rates include a one-year USENIX membership.

### HOTEL INFORMATION

**Hotel Discount Reservation Deadline is  
October 16, 2006**

Red Lion Hotel on 5th Avenue  
Rate is \$139 single/double plus 15.6% tax

## THANKS TO OUR SPONSORS

Amazon.com	IBM	NSF
Ask.com	Infosys	NTT DoCoMo
Google	Intel	Sun Microsystems
HP	Microsoft Research	VMware

<http://www.usenix.org/osdi2006>

## SYMPOSIUM ORGANIZERS

### PROGRAM CO-CHAIRS

Brian Bershad, *University of Washington*  
Jeff Mogul, *Hewlett-Packard Labs*

### PROGRAM COMMITTEE

Martin Abadi, *University of California, Santa Cruz,  
and Microsoft Research*  
Brad Calder, *University of California, San Diego, and Microsoft*  
Brad Chen, *Intel*  
Peter Druschel, *Max Planck Institute for Software Systems*  
Garth Gibson, *Carnegie Mellon University and Panasas*  
Derek McAuley, *XenSource Inc.*  
Rob Pike, *Google Inc.*  
Mema Roussopoulos, *Harvard University*  
Dawn Song, *Carnegie Mellon University*  
Chandu Thekkath, *Microsoft Research*  
Robbert van Renesse, *Cornell University*  
Jim Waldo, *Sun Microsystems, Inc.*  
Bill Weihl, *Google Inc.*

### POSTER SESSION CHAIR

Mema Roussopoulos, *Harvard University*

### WORK-IN-PROGRESS (WIP) SESSION CHAIR

Jim Waldo, *Sun Microsystems, Inc.*

### STEERING COMMITTEE

Eric Brewer, *University of California, Berkeley*  
Peter Chen, *University of Michigan, Ann Arbor*  
Mike Jones, *Microsoft*  
Jay Lepreau, *University of Utah*  
Ellie Young, *USENIX*

## Monday, November 6

8:45 a.m.–9:00 a.m. Monday

### OPENING REMARKS AND AWARDS

9:00 a.m.–10:30 a.m. Monday

### LOCAL STORAGE

#### Rethink the Sync

Edmund B. Nightingale, Kaushik Veeraraghavan, Peter M. Chen, and Jason Flinn, *University of Michigan*

#### Type-Safe Disks

Gopalan Sivathanu, Swaminathan Sundararaman, and Erez Zadok, *Stony Brook University*

#### Stasis: System for Adaptable, Transactional Storage

Russell Sears and Eric Brewer, *University of California, Berkeley*

10:30 a.m.–11:00 a.m. Break

11:00 a.m.–12:30 p.m. Monday

### RUNTIME RELIABILITY MECHANISMS

#### SafeDrive: Safe and Recoverable Extensions Using Language-Based Techniques

Feng Zhou, Jeremy Condit, Zachary Anderson, and Ilya Bagrak, *University of California, Berkeley*; Rob Ennals, *Intel Research, Cambridge, UK*; Matthew Harren, George C. Necula, and Eric Brewer, *University of California, Berkeley*

#### BrowserShield: Vulnerability-Driven Filtering of Dynamic HTML

Charles Reis, *University of Washington*; John Dunagan, Helen J. Wang, and Opher Dubrovsky, *Microsoft*; Saher Esmeir, *Technion*

#### XFI: Software Guards for System Address Spaces

Ulfar Erlingsson and Martin Abadi, *Microsoft Research, Silicon Valley*; Michael Vrable, *University of California, San Diego*; Mihai Budiu, *Microsoft Research, Silicon Valley*; George C. Necula, *University of California, Berkeley*

12:30 p.m.–2:00 p.m. Lunch (on your own)

2:00 p.m.–3:30 p.m. Monday

### OS IMPLEMENTATION STRATEGIES

#### Operating System Profiling via Latency Analysis

Nikolai Joukov, Avishay Traeger, and Rakesh Iyer, *Stony Brook University*; Charles P. Wright, *IBM T. J. Watson Research Center*; Erez Zadok, *Stony Brook University*

#### CRAMM: Virtual Memory Support for Garbage-Collected Applications

Ting Yang and Emery D. Berger, *University of Massachusetts Amherst*; Scott F. Kaplan, *Amherst College*; J. Eliot B. Moss, *University of Massachusetts Amherst*

#### Flight Data Recorder: Monitoring Persistent-State Interactions to Improve Systems Management

Chad Verbowski, Emre Kiciman, Arunvijay Kumar, and Brad Daniels, *Microsoft Research*; Shan Lu, *University of Illinois at Urbana-Champaign*; Juhan Lee, *Microsoft MSN*; Yi-Min Wang, *Microsoft Research*; Roussi Roussev, *Florida Institute of Technology*

3:30 p.m.–4:00 p.m. Break

4:00 p.m.–5:30 p.m. Monday

### WORK-IN-PROGRESS REPORTS (WiPs)

7:00 p.m.–8:30 p.m. Poster Session & Reception

Co-Sponsored by USENIX and Google

8:30 p.m.–11:00 p.m. Birds-of-a-Feather Sessions

## Tuesday, November 7

9:00 a.m.–10:30 a.m. Tuesday

### PROGRAM ANALYSIS TECHNIQUES

#### EXPLODE: A Lightweight, General System for Finding Serious Errors in Storage Systems

Junfeng Yang, Can Sar, and Dawson Engler, *Stanford University*

#### Securing Software by Enforcing Data-flow Integrity

Miguel Castro, *Microsoft Research*; Manuel Costa, *Microsoft Research and University of Cambridge*; Tim Harris, *Microsoft Research*

#### From Uncertainty to Belief: Inferring the Specification Within

Ted Kremenek, *Stanford University*; Godmar Back, *Virginia Polytechnic Institute and State University*; Paul Twohey, Dawson Engler, and Andrew Ng, *Stanford University*

10:30 a.m.–11:00 a.m. Break

11:00 a.m.–12:30 p.m. Tuesday

### DISTRIBUTED SYSTEM INFRASTRUCTURE

#### HQ Replication: A Hybrid Quorum Protocol for Byzantine Fault Tolerance

James Cowling, Daniel Myers, and Barbara Liskov, *Massachusetts Institute of Technology*; Rodrigo Rodrigues, *INESC-ID and Instituto Superior Tecnico*; Liuba Shrira, *Brandeis University*

#### BAR Gossip

Harry Li, Allen Clement, Edmund Wong, Jeff Napper, Indrajit Roy, Lorenzo Alvisi, and Michael Dahlin, *University of Texas at Austin*

#### Bigtable: A Distributed Storage System for Structured Data

Fay Chang, Jeffrey Dean, Sanjay Ghemawat, Wilson C. Hsieh, Deborah A. Wallach, Mike Burrows, Tushar Chandra, Andrew Fikes, and Robert E. Gruber, *Google, Inc.*

12:30 p.m.–2:00 p.m. Symposium Luncheon

#### Presentation of 2006 ACM/SIGOPS Mark Weiser Award

2:00 p.m.–3:30 p.m. Tuesday

### DISTRIBUTED SYSTEMS OF LITTLE THINGS

#### EnsemBlue: Integrating Distributed Storage and Consumer Electronics

Daniel Peek and Jason Flinn, *University of Michigan*

#### Persistent Personal Names for Globally Connected Mobile Devices

Bryan Ford, Jacob Strauss, Chris Lesniewski-Laas, Sean Rhea, Frans Kaashoek, and Robert Morris, *Massachusetts Institute of Technology*

### A Modular Network Layer for Sensornets

Cheng Tien Ee, Rodrigo Fonseca, Sukun Kim, Daekyeong Moon, and Arsalan Tavakoli, *University of California, Berkeley*; David Culler, *Arch Rock Corporation and University of California, Berkeley*; Scott Shenker, *ICSI and University of California, Berkeley*; Ion Stoica, *University of California, Berkeley*

3:30 p.m.–4:00 p.m. Break

4:00 p.m.–5:30 p.m. Tuesday

### OPERATING SYSTEM STRUCTURE

#### Making Information Flow Explicit in HiStar

Nickolai Zeldovich and Silas Boyd-Wickizer, *Stanford University*; Eddie Kohler, *University of California, Los Angeles*; David Mazières, *Stanford University*

#### Splitting Interfaces: Making Trust Between Applications and Operating Systems Configurable

Richard Ta-Min, Lionel Litty, and David Lie, *University of Toronto*

#### Connection Handoff Policies for TCP Offload Network Interfaces

Hyong-young Kim and Scott Rixner, *Rice University*

6:30 p.m.–10:30 p.m. Reception

Museum of Flight, Sponsored by Microsoft Research

## Wednesday, November 8

9:00 a.m.–10:30 a.m. Wednesday

### DISTRIBUTED STORAGE AND LOCKING

#### Ceph: A Scalable, High-Performance Distributed File System

Sage Weil, Scott Brandt, Ethan Miller, Darrell Long, and Carlos Maltzahn, *University of California, Santa Cruz*

#### Distributed Directory Service in the Farsite File System

John Douceur and Jon Howell, *Microsoft Research*

#### The Chubby Lock Service for Loosely-coupled Distributed Systems

Mike Burrows, *Google, Inc.*

10:30 a.m.–11:00 a.m. Break

11:00 a.m.–12:30 p.m. Wednesday

### LARGE DISTRIBUTED SYSTEMS

#### Experiences Building PlanetLab

Larry Peterson, Andy Bavier, Marc Fluczynski, and Steve Muir, *Princeton University*

#### iPlane: An Information Plane for Distributed Services

Harsha Madhyastha, Tomas Isdal, Michael Piatek, Colin Dixon, Thomas Anderson, and Arvind Krishnamurthy, *University of Washington*; Arun Venkataramani, *University of Massachusetts Amherst*

#### Fidelity and Yield in a Volcano Monitoring Sensor Network

Geoff Werner-Allen and Konrad Lorincz, *Harvard University*; Jeff Johnson, *University of New Hampshire*; Jonathan Lees, *University of North Carolina*; Matt Welsh, *Harvard University*