

**conference**

*proceedings*

**2009 USENIX  
Annual Technical  
Conference**

*San Diego, CA, USA  
June 14–19, 2009*

Sponsored by  
The USENIX Association  
**USENIX**  
THE ADVANCED COMPUTING SYSTEMS ASSOCIATION

**USENIX**

Proceedings of the 2009 USENIX Annual Technical Conference

San Diego, CA, USA June 14–19, 2009

ISBN: 978-1-931971-68-3

## Thanks to Our Sponsors

### Silver Sponsor



### Bronze Sponsors



### Sponsor



### Media Sponsors

ACM *Queue*  
Addison-Wesley Professional/  
Prentice Hall Professional/  
Cisco Press  
*BetaNews*  
ConferenceGuru  
Distributed Management  
Task Force, Inc.  
*Free Software Magazine*

Hackett and Bankwell:  
The Linux Comic  
Help Net Security  
*IEEE Security & Privacy*  
InfoSec News  
*Linux Gazette*  
*Linux Journal*  
*Linux Pro Magazine*

LXer.com  
Messaging News  
Network World ITRoadmap  
No Starch Press  
SNIA  
Toolbox.com  
UserFriendly.org

© 2009 by The USENIX Association  
All Rights Reserved

This volume is published as a collective work. Rights to individual papers remain with the author or the author's employer. Permission is granted for the noncommercial reproduction of the complete work for educational or research purposes. USENIX acknowledges all trademarks herein.

ISBN: 978-1-931971-68-3

## The USENIX Association

Since 1975, the USENIX Association has brought together the community of system administrators, developers, programmers, and engineers working on the cutting edge of the computing world. USENIX conferences have become the essential meeting grounds for the presentation and discussion of the most advanced information on new developments in all aspects of advanced computing systems. USENIX and its members are dedicated to:

- problem-solving with a practical bias
- fostering technical excellence and innovation
- encouraging computing outreach in the community at large
- providing a neutral forum for the discussion of critical issues

For more information about membership and its benefits, conferences, or publications, see <http://www.usenix.org>.

## SAGE, a USENIX Special Interest Group

SAGE is a Special Interest Group of the USENIX Association. Its goal is to serve the system administration community by:

- Establishing standards of professional excellence and recognizing those who attain them
- Promoting activities that advance the state of the art or the community
- Providing tools, information, and services to assist system administrators and their organizations
- Offering conferences and training to enhance the technical and managerial capabilities of members of the profession

Find out more about SAGE at <http://www.sage.org>.

## Thanks to USENIX & SAGE Corporate Supporters

### USENIX Patron



### USENIX Benefactors



### USENIX & SAGE Partners

Ajava Systems, Inc.  
DigiCert® SSL Certification  
FOTO SEARCH Stock Footage  
and Stock Photography  
Hyperic Systems Monitoring  
Splunk  
Zenoss

### USENIX Partners

Cambridge Computer Services, Inc.  
GroundWork  
Open Source Solutions  
Xirrus

### SAGE Partner

MSB Associates