NOTES

USENIX Member Benefits

Members of the USENIX Association receive the following benefits:

Free subscription to *;login:*, the Association's magazine, published six times a year, featuring technical articles, system administration articles, tips and techniques, practical columns on such topics as security, Perl, networks, and operating systems, book reviews, and reports of sessions at USENIX conferences.

Access to *;login:* online from December 1997 to the current month: www.usenix.org/publications/login/

Access to videos from USENIX events in the first six months after the event: www.usenix.org/publications/multimedia/

Discounts on registration fees for all USENIX conferences

Special discounts on a variety of products, books, software, and periodicals: www.usenix.org/member-services/discount-instructions

The right to vote on matters affecting the Association, its bylaws, and election of its directors and officers

For more information regarding membership or benefits, please see www.usenix.org/membership/ or contact office@usenix.org. Phone: 510-528-8649

USENIX Board of Directors

Communicate directly with the USENIX Board of Directors by writing to board@usenix.org.

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EXECUTIVE DIRECTOR
Casey Henderson
casey@usenix.org

2016 Election for the USENIX Board of Directors

by Casey Henderson, USENIX Executive Director

The biennial election for officers and directors of the Association will be held in the spring of 2016. A report from the Nominating Committee is now available on the USENIX Web site at www.usenix.org/board/elections16. USENIX members will receive notification of this report via email.

Nominations from the membership are open until January 4, 2016. To nominate an individual, send a written statement of nomination signed by at least five (5) members in good standing, or five separately signed nominations for the same person, to the Executive Director at the Association offices, to be received by noon PST, January 4, 2016. Please prepare a plain-text Candidate's Statement and send both the statement and a photograph (minimum size 1800 pixels by 1200 pixels) to production@usenix.org, to be included in the ballots.

Ballots will be mailed to all paid-up members in early February 2016. Ballots must be received in the USENIX offices by March 21, 2016. The results of the election will be announced on the USENIX Web site by March 30 and will be published in the Summer 2016 issue of *;login:*.

The Board consists of eight directors, four of whom are "at large." The others are the president, vice president, secretary, and treasurer. The balloting is preferential: those candidates with the largest numbers of votes are elected. Ties in elections for directors shall result in run-off elections, the results of which shall be determined by a majority of the votes cast. Newly elected directors will take office at the conclusion of the first regularly scheduled meeting following the election, or on July 1, 2016, whichever comes earlier.

Team USA Continues to Impress at IOI 2015 in Kazakhstan

Brian C. Dean, Director of the USA Computing Olympiad

I am always amazed at the computing talent shown by the top high school students in this country.

This summer, I traveled to Almaty, Kazakhstan, to lead a team of high-school computer-science students—the top four from the entire USA—to compete at the 27th International Olympiad in Informatics (IOI), the most prestigious computing contest in the world at the high-school level. Aside from myself and deputy leaders Mark Gordon and Amy Quispe, team USA this year consisted of:

- Daniel Chiu, a sophomore from Catlin Gable High School in Oregon
- Demi Guo, a junior studying abroad at Hangzhou No. 2 High School in China
- Andrew He, a senior from Monta Vista High School in California
- Alexander Wei, a junior from Phillips Exeter Academy in New Hampshire

Joining us in this week-long event were 318 other students representing 82 countries, all eager to put their algorithmic programming skills to the test to vie for glory in the form of gold, silver, and bronze medals. I am thrilled to report that our team had one of its best showings ever: three gold medals (Chiu, He, Wei) and one silver (Guo). Gold medals are only awarded to the top 1/12 of all participants, and no other country earned more than three, putting team USA right at the top alongside other powerhouse countries such as China, South Korea, and Russia. Andrew He even earned third place individually, improving on his gold medal performance at IOI 2014.

The competition format at the IOI involves two five-hour contests, each asking students to code solutions for three challenging problems of an algorithmic nature. The difficulty is exceedingly high—at a level that would probably stump most graduate students in computing. Only one competitor earned a perfect score this year, Jeehak Yoon from South Korea. As an example of one of the problems, suppose you need to deliver boxes from a depot to N different houses, all situated at different locations on a long circular road. You have at your disposal a truck that can hold only K boxes at a time, and you want to determine the minimum driving distance needed to deliver every box. The values of N and K can be in the millions, and your program needs to run in less than a second to receive full marks. Every student on team USA received a perfect score on this problem, one of the easier problems in the contest.

Aside from the competition, our IOI hosts organized a variety of cultural activities, excursions, social events, and other activities that helped expose everyone to Kazakh culture and tradition. My favorite excursion was into the nearby mountains, where a half-hour cable car ride brought us to a vantage point 10,000 feet high with stunning views of the city below. We also had a chance to experience Kazakh cuisine, where I discovered new foods that tasted fairly good (e.g., horse meat), and others that I'm fairly certain may be more of an acquired taste (e.g., camel milk). During the opening and closing ceremonies we were treated to a wide range of Kazakh song and dance. The entire week was a wonderful experience for all involved, and we look forward to IOI 2016, to be held in Kazan, Russia.

The reason team USA has performed so well at recent IOIs is largely due to the rigorous selection and training process we use to create our team each year, overseen by a national organization called the USA Computing Olympiad (USACO). The USACO is a non-profit organization that provides online training material and programming contests for students of all ages interested in learning algorithmic problem solving. Thousands take part in our contests each year, starting with our easiest "bronze" division problems that require basic programming ability but no specific algorithmic knowledge. Successful students are promoted to the "silver" division, where contest problems help them learn standard algorithmic techniques. Those who excel in silver are finally promoted to our "gold" division, featuring our most challenging problems (roughly on par with IOI problems). Each year we invite the top two dozen gold competitors in the USA to attend a rigorous summer training camp at Clemson University, from which the team of four is ultimately selected to attend the IOI. Training camp is a whirlwind experience packed with practice contests, advanced lectures, and fun side activities. Our goal with camp (and also with the USACO in general) is not only to train a winning team to attend the IOI, but to inspire students about computing as a discipline and to encourage them to fill the ranks of the next generation of top computer scientists.

The USACO is run by a small but dedicated group of volunteer coaches and supported entirely by funds provided by our corporate sponsors. I am exceedingly grateful for our support from USENIX, one of our strongest and most loyal sponsors. This support has enabled our program to grow and evolve, nearly doubling in size in the past five years alone. Based on the impressive accomplishments of our alums to date, your sponsorship has created a measureable and substantial impact in cutting-edge computing, both in academia and industry.

This year was particularly poignant for our organization, due to the passing of Dr. Donald Piele, who founded the USACO nearly two decades ago. Don posthumously received the IOI's "distinguished service award" to recognize his contributions to the IOI community. Don's early work with the USACO has inspired countless students—myself included—to pursue careers in computing, and I am honored to be able to continue leading the organization so that it may continue to inspire others.

To the USENIX community: thank you again for your outstanding support for high-school computing, and I look forward to reporting continued good results from IOI 2016 and beyond! To learn more about the USACO, please visit our Web site at usaco.org.

Thanks to Our Volunteers

by Casey Henderson, USENIX Executive Director

As many of our members know, USENIX's success is attributable to a large number of volunteers who lend their expertise and support for our conferences, publications, good works, and member services. They work closely with our staff in bringing you the best in the fields of systems research and system administration. Many of you have participated on program committees, steering committees, and subcommittees, as well as contributing to this magazine. The entire USENIX staff and I are most grateful to you all. Below, I would like to make special mention of some people who made particularly significant contributions in 2015.

Program Chairs

13th USENIX Conference on File and Storage Technologies (FAST '15)
Jiri Schindler and Erez Zadok

2015 USENIX Research in Linux File and Storage Technologies Summit (Linux FAST Summit '15)
Ric Wheeler

12th USENIX Symposium on Networked Systems Design and Implementation (NSDI '15)
Paul Barham and Arvind Krishnamurthy

SREcon15
Sabrina Farmer, Andrew Fong, and Fernanda Weiden

SREcon15 Europe
Narayan Desai and John Looney

15th Workshop on Hot Topics in Operating Systems (HotOS XV)
George Candea

2015 USENIX Annual Technical Conference (ATC '15)
Shan Lu and Erik Riedel

7th USENIX Workshop on Hot Topics in Cloud Computing (HotCloud '15)
Irfan Ahmad and Tim Kraska

7th USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage '15)
Ken Salem and John Strunk

24th USENIX Security Symposium (USENIX Security '15)
Jaeyeon Jung

9th USENIX Workshop on Offensive Technologies (WOOT '15)
Aurélien Francillon and Thomas Ptacek

2015 USENIX Journal of Election Technology and Systems Workshop (JETS '15)
Walter Mebane and Dan S. Wallach, Program Chairs and Editors-in-Chief, *USENIX Journal of Election Technology and Systems (JETS)*

8th Workshop on Cyber Security Experimentation and Test (CSET '15)
Adam Aviv and Iulian Neamtiu

5th USENIX Workshop on Free and Open Communications on the Internet (FOCI '15)
Masashi Crete-Nishihata and Phillipa Gill

2015 USENIX Workshop on Health Information Technologies (HealthTech '15)
Apu Kapadia and David Kotz

2015 USENIX Summit on Gaming, Games, and Gamification in Security Education (3GSE '15)
Mark Gondree and Zachary N J Peterson

2015 USENIX Summit on Hot Topics in Security (HotSec '15)
Joseph Bonneau and Carrie Gates

29th Large Installation System Administration Conference (LISA15)
Cory Lueninghoener and Amy Rich

2015 USENIX Release Engineering Summit (URES '15)
Gareth Bowles and Dinah McNutt

2015 USENIX Container Management Summit (UCMS '15)
Matthew Barr and Ashley Penney

Other Chairs and Major Contributors

FAST '15
Poster Chair: Donald Porter
Tutorial Coordinator: John Strunk

Linux FAST Summit '15
Organizational Assistance: Christoph Hellwig and Theodore Ts'o

NSDI '15
Poster Session Co-Chairs: Rama Ramasubramanian and Franziska Roesner

USENIX Security '15
Deputy Program Chair: Thorsten Holz
Invited Talks Committee: Michael Bailey, Angelos Keromytis (Chair), Damon McCoy, and Gary McGraw
Poster Session Co-Chairs: Adam Doupé and Sarah Meiklejohn
Work-in-Progress Reports (WiPs) Coordinator: Tadayoshi Kohno

LISA15
Invited Talks Co-Chairs: Doug Hughes and Mario Obejas
Academic Co-Chairs: Paul Anderson and Marc Chiarini
Workshops Chair and Lightning Talks Coordinator: Lee Damon
LISA Lab Co-Chairs: Tony Del Porto and Andrew Mundy
LISA Build Coordinators: Branson Matheson and Brett Thorson

Storage Pavilion and Data Storage Day at LISA15
Organizer: Jacob Farmer of Cambridge Computer

2015 USENIX Journal of Education in System Administration (JESA)
Editors-in-Chief: Kyrre Begnum and Charles Border

USENIX Board of Directors
Cat Allman, John Arrasjid, David Blank-Edelman, Daniel V. Klein, Brian Noble, Kurt Opsahl, Carolyn Rowland, and Hakim Weatherspoon

Audit Committee
Cat Allman, John Arrasjid, and Niels Provos

Awards Committee
Brian Noble and Matt Simmons

Development Advisory Committee
Cat Allman, John Arrasjid, Brian Noble, Kurt Opsahl, and Hakim Weatherspoon

USA Computing Olympiad (co-sponsored by USENIX)
Team Leader: Brian Dean
Deputy Team Leaders: Mark Gordon and Amy Quispe

HotCRP Submissions and Reviewing System
Eddie Kohler

USENIX and LISA Blogger
Ben Cotton

;login: Goes Quarterly

by Casey Henderson, USENIX Executive Director

In 2016, *;login:* is taking the next step in its long history: It will change from a bimonthly to a quarterly schedule, with four issues per year.

Prior to becoming a bimonthly magazine in 1997, *;login:* was a bimonthly newsletter, albeit a beefy one. At its inception, *;login:* truly was a newsletter, tracing its roots to the "USENIX NEWS" pamphlets we've been revisiting to celebrate USENIX's 40th anniversary. This December 2015 issue of *;login:* is nearly unrecognizable when compared to those early missives. It's largely to the credit of Rik Farrow, our editor for many years, that the magazine you're currently reading is such a thorough celebration of the state of the art across the many communities that USENIX represents.

For each issue, Rik gathers content by attending conferences, contacting authors of papers or articles touching on the latest research and practice in our field, and revisiting connections he's gathered and maintained during his years as a key member of the community. Then our production team, led by managing editor Michele Nelson, takes over to lay out and produce this volume. The *;login:* production cycle never ends, because we're working on the next issue well before the current one arrives in your mailbox. A quarterly schedule will stretch out these periods to be much saner for our busy staff, while still delivering a similar amount of high quality content you receive annually. You can expect each quarterly issue to be lengthier than the bimonthly issues you've been receiving.

For those of you who are USENIX members, you're aware that *;login:* is one of our primary membership benefits. While *;login:* officially accounts for $90 of each member's annual dues, rising production costs are straining the budget. We have not raised dues for many years—since 2008, in fact—in order to keep membership as affordable as possible. Though we had considered an increase in membership dues for 2016, I have recommended to the USENIX Board that we continue to maintain the current rate, partially in light of this change in *;login:'s* number of issues.

Although there are many people involved in *;login:'s* success, from the authors of articles to the typesetter, please join me in thanking Rik and Michele in particular for their dedication to keeping *;login:* the top-notch publication it is. They're both excited about the extra breathing room this schedule will offer them, including the opportunity to not work on *;login:* while ostensibly on vacation. If *;login:* is your vacation reading material of choice, you can enjoy the magazine even more knowing that its creators are now able to have a similar opportunity to relax.

CoolDC '16: USENIX Workshop on Cool Topics in Sustainable Data Centers

March 19, 2016 • Santa Clara, CA

Sponsored by USENIX, the Advanced Computing Systems Association

The USENIX Workshop on Cool Topics in Sustainable Data Centers (CoolDC '16) will take place on March 19, 2016, directly following NSDI '16 in Santa Clara, CA.

Important Dates

- Paper submissions due: **Tuesday, December 15, 2015, 8:59 p.m. PST**
- Notification to authors: **Tuesday, February 2, 2016**
- Final paper files due: **Tuesday, March 1, 2016**

Workshop Organizers

Program Co-Chairs

Weisong Shi, *Wayne State University*
Thomas F. Wenisch, *University of Michigan*

Program Committee

Kirk Cameron, *Virginia Tech*
Christina Delimitrou, *Stanford University*
Michael Ferdman, *Stony Brook University*
David Irwin, *University of Massachusetts Amherst*
Tao Li, *University of Florida/NSF*
Jie Liu, *Microsoft Research*
Chris Malone, *Google*
Karthick Rajamani, *IBM Research*
Anand Sivasubramaniam, *The Pennsylvania State University*
Xiaorui Wang, *The Ohio State University*
Qiang Wu, *Facebook*
Zhe Zhang, *Cloudera*

Overview

Around the mid-2000s, the advent of mega-scale internet services and public cloud offerings led to a redesign of data center architectures which addressed key inefficiencies, particularly in electrical and mechanical infrastructure. At the same time, accelerated need for efficient servers spurred a generation of research on CPU, memory, network, and storage power management techniques, which have led to a marked improvement in server efficiency and energy proportionality. However, this first generation of improvement has plateaued; further opportunity in the large-scale mechanical infrastructure is limited, and no single server or network component stands out as the key source of inefficiency. Hence, it is time for a second, holistic, clean-slate redesign of the data center, encompassing new server architectures, heterogeneous computing platforms, radical networking paradigms, new mechanical and electrical designs, intelligent cluster management, and radical rethinking of software architectures while considering changing usage patterns (e.g., hybrid private/public clouds).

In addition to developing promising technologies to improve data center efficiency, we also need new metrics to assess the success of SDC research. Currently, power usage effectiveness (PUE) is a widely reported metric to assess the energy efficiency of a data center. The impact of renewables can be assessed via carbon usage effectiveness (CUE) to measure the combined impact of clean energy and energy efficiency on greenhouse gas emissions, and water usage effectiveness (WUE) can be used to assess the water usage of a data center. And yet, all three of these metrics fall short of describing the true efficiency of the data center. They fail to reflect waste at the enclosure/tray level (e.g., VRMs, server fans). Moreover, they do not assess the efficiency or value of the computation being performed and hence fail to reflect server hardware inefficiencies or software bloat.

The 2016 USENIX Workshop on Cool Topics in Sustainable Data Centers (CoolDC '16) is a forum to disseminate results and stimulate further cutting-edge research in quantitative design, evaluation, and research methods for sustainable data centers. The goal of the workshop is to become a venue where experts in sustainable energy systems, data center physical infrastructure, networking and server architecture, cloud computing, and internet-scale applications can come together to exchange ideas on how to maintain and improve the sustainability of warehouse-scale computer infrastructure.

Topics

Topics of interest in sustainable data centers include but are not limited to:

- Instrumentation, measurement, and characterization studies
- Metrics, benchmarks, interfaces
- Performance, energy and other resource trade-offs, energy complexity
- Energy-efficient software optimization, application design
- System-level optimization, cross-layer coordination
- Scheduling, run-time adaptation, feedback control

- Processor, memory, network, storage, hardware components and architecture
- Reliability and power management
- Thermal management
- Green energy sources and their implications
- Technologies for and management of energy storage
- Life-cycle analysis

The workshop seeks submissions of early-stage research and novel ideas that have a high likelihood of generating interesting discussion.

Submission Instructions

Please submit your papers by 8:59 p.m. PST on December 15, 2015. Papers must be in PDF format and must be submitted via the Web submission form linked from the Call for Papers Web site, www.usenix.org/cooldc16/cfp. Do not email submissions.

Submitted papers must be no longer than 6 single-spaced 8.5" x 11" pages. The complete submission should be typeset in two-column format in 10-point type on 12-point (single-spaced) leading, with the text block being no more than 6.5" wide by 9" deep. Submissions that violate any of these restrictions may not be reviewed. The limits will be interpreted fairly strictly, and no extensions will be given for reformatting. If you wish, you may use our LaTeX templates and style files, available at www.usenix.org/conferences/author-resources/paper-templates.

Reviewing will be double-blind; therefore, please do not include any author names on any submitted documents except in the space provided on the submission form. You must also ensure that the metadata included in the PDF does not give away the authors. If you are improving upon your prior work, refer to your prior work in the third person and include a full citation for the work in the bibliography. For example, if you are building on your own prior work in the papers [1, 2, 3], you would say something like: "While prior work did X, Y, and Z [1, 2, 3], this paper additionally does W, and is therefore much better." Do NOT omit or anonymize references for blind review.

Submissions to CoolDC '16 may not be under consideration for any other venue. Simultaneous submission of the same work to multiple venues, submission of previously published work, or plagiarism constitutes dishonesty or fraud. USENIX, like other scientific and technical conferences and journals, prohibits these practices and may take action against authors who have committed them. See the USENIX Conference Submissions Policy at www.usenix.org/conferences/submissions-policy for details.

Questions? Contact your program co-chairs, cooldc16chairs@usenix.org, or the USENIX office, submissionspolicy@usenix.org.

Papers accompanied by nondisclosure agreement forms will not be considered. Accepted submissions will be treated as confidential prior to publication on the CoolDC '16 Web site; rejected submissions will be permanently treated as confidential.

All papers will be available online to registered attendees before the workshop. If your accepted paper should not be published prior to the event, please notify production@usenix.org. The papers will be available online to everyone beginning on the day of the workshop, March 19, 2016.

Rev. 11/10/15

2016 USENIX Annual Technical Conference

June 22–24, 2016, Denver, CO

Sponsored by USENIX, the Advanced Computing Systems Association

Important Dates

- Paper submissions due: **Monday, February 1, 2016, 11:59 p.m. GMT**
- Notification to authors: **Friday, April 15, 2016**
- Final paper files due: **Tuesday, May 24, 2016**

Conference Organizers

Program Co-Chairs

Hakim Weatherspoon, *Cornell University*
Ajay Gulati, *Zerostack, Inc.*

Program Committee

Mohit Aron, *Cohesity*
Mahesh Balakrishnan, *Yale University*
Haibo Chen, *Shanghai Jiao Tong University*
Byung-Gon Chun, *Seoul National University*
Paolo Costa, *Microsoft Research*
Dilma Da Silva, *Texas A&M University*
Angela Demke Brown, *University of Toronto*
Fred Douglis, *EMC*
Rodrigo Fonseca, *Brown University*
K. Gopinath, *Indian Institute of Science (IISc)*
Haryadi Gunawi, *University of Chicago*
Indranil Gupta, *University of Illinois at Urbana–Champaign*
Andreas Haeberlen, *University of Pennsylvania*
Tim Harris, *Oracle*
Anne M. Holler, *FUEGO*
Jon Howell, *Google*
Hani Jamjoom, *IBM*
Anthony Joseph, *University of California, Berkeley*
Geoff Kuenning, *Harvey Mudd College*
Peter Pietzuch, *Imperial College London*
Sriram Rao, *Microsoft*
Benjamin Reed, *Facebook*
Scott Rixner, *Rice University*
Henry Robinson, *Cloudera*
Leonid Ryzhyk, *Samsung Research America*
Liuba Shrira, *Brandeis University*
Nisha Talagala, *Parallel Machines*
Theodore Ts'o, *Google*
Dan Tsafrir, *Israel Institute of Technology*
Andy Tucker, *Bracket*
Zhen Xiao, *Peking University*
Noa Zilberman, *University of Cambridge*

Overview

Authors are invited to submit original and innovative papers to the Refereed Papers Track of the 2016 USENIX Annual Technical Conference. We seek high-quality submissions that further the knowledge and understanding of modern computing systems with an emphasis on implementations and experimental results. We encourage papers that break new ground, present insightful results based on practical experience with computer systems, or are important, independent reproductions/refutations of the experimental results of prior work. USENIX ATC '16 has a broad scope, and specific topics of interest include (but are not limited to):

- Architectural interaction
- Big data infrastructure
- Cloud computing
- Datacenter networking
- Deployment experience
- Distributed and parallel systems
- Embedded systems
- Energy/power management
- File and storage systems
- Mobile and wireless
- Networking and network services
- Operating systems
- Reliability, availability, and scalability
- Security, privacy, and trust
- System and network management and troubleshooting
- Usage studies and workload characterization
- Virtualization

USENIX ATC '16 is especially interested in papers broadly focusing on practical techniques for building better software systems: ideas or approaches that provide practical solutions to significant issues facing practitioners. This includes all aspects of system development: techniques for developing systems software; analyzing programs and finding bugs; making systems more efficient, secure, and reliable; and deploying systems and auditing their security.

Experience reports and operations-oriented studies, as well as other work that studies software artifacts, introduces new data sets of practical interest, or impacts the implementation of software components in areas of active interest to the community are well-suited for the conference.

The conference seeks both long-format papers consisting of 11 pages and short-format papers of 5 pages, not including references. Short papers will be included in the proceedings, and will be presented as normal but in sessions with slightly shorter time limits.

For industrial practitioners, if you are interested in the Practitioner Talks Track, which accepts proposals for 20-minute or 40-minute talks, please refer to the USENIX ATC '16 Call for Talks Web page at www.usenix.org/atc16/cft.

Best Paper Awards

Cash prizes will be awarded to the best papers at the conference. Please see www.usenix.org/conferences/best-papers for Best Paper winners from previous years.

Best of the Rest Track

The USENIX Annual Technical Conference is the senior USENIX forum covering the full range of technical research in systems software. Over the past two decades, USENIX has added a range of more specialized conferences. ATC is proud of the content being published by its sibling USENIX conferences and will be bringing a track of encore presentations to ATC '16. This "Best of the Rest" track will allow attendees to sample the full range of systems software research in one forum, offering both novel ATC presentations and encore presentations from recent offerings of ATC's sibling conferences.

What to Submit

Authors are required to submit full papers by the paper submission deadline. *It is a hard deadline; no extensions will be given.* All submissions for USENIX ATC '16 will be electronic, in PDF format, via the Web submission form on the Call for Papers Web site, www.usenix.org/atc16/cfp.

USENIX ATC '16 will accept two types of papers:

Full papers: Submitted papers must be no longer than 11 single-spaced 8.5" x 11" pages, including figures and tables, but **not** including references. You may include any number of pages for references. Papers should be formatted in 2 columns, using 10-point type on 12-point leading, in a 6.5" x 9" text block. Figures and tables must be large enough to be legible when printed on 8.5" x 11" paper. Color may be used, but the paper should remain readable when printed in monochrome. The first page of the paper should include the paper title and author name(s); reviewing is single blind. Papers longer than 11 pages, **not including references,** or violating formatting specifications will not be reviewed. In a good paper, the authors will have:

- Addressed a significant problem
- Devised an interesting and practical solution or provided an important, independent, and experimental reproduction/refutation of prior solutions
- Clearly described what they have and have not implemented
- Demonstrated the benefits of their solution
- Articulated the advances beyond previous work
- Drawn appropriate conclusions

Short papers: Authors with a contribution for which a full paper is not appropriate may submit short papers of at most 5 pages, **not including references,** with the same formatting guidelines as full papers. You may include any number of pages for references. Examples of short paper contributions include:

- Original or unconventional ideas at a preliminary stage of development
- The presentation of interesting results that do not require a full-length paper, such as negative results or experimental validation
- Advocacy of a controversial position or fresh approach

For more details on the submission process and for templates to use with LaTeX and Word, authors should consult the detailed submission requirements linked from the Call for Papers Web site. Specific questions about submissions may be sent to atc16chairs@usenix.org.

By default, all papers will be made available online to registered attendees before the conference. If your accepted paper should not be published prior to the event, please notify production@usenix.org. In any case, the papers will be available online to everyone beginning on the first day of the conference, June 22, 2016.

Papers accompanied by nondisclosure agreement forms will not be considered. Accepted submissions will be treated as confidential prior to publication on the USENIX ATC '16 Web site; rejected submissions will be permanently treated as confidential.

Simultaneous submission of the same work to multiple venues, submission of previously published work, or plagiarism constitutes dishonesty or fraud. USENIX, like other scientific and technical conferences and journals, prohibits these practices and may take action against authors who have committed them. See the USENIX Conference Submissions Policy at www.usenix.org/conferences/submissions-policy for details.

Note that the above does not preclude the submission of a regular full paper that overlaps with a previous short paper or workshop paper. However, any submission that derives from an earlier paper must provide a significant new contribution (for example, by providing a more complete evaluation), and must explicitly mention the contributions of the submission over the earlier paper. If you have questions, contact your program co-chairs, atc16chairs@usenix.org, or the USENIX office, submissionspolicy@usenix.org.

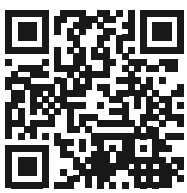
Authors will be notified of paper acceptance or rejection by April 15, 2016. Acceptance will typically be conditional, subject to shepherding by a program committee member.

Poster Session

The poster session is an excellent forum to discuss ideas and get useful feedback from the community. Posters and demos for the poster session will be selected from all the full paper and short paper submissions by the poster session chair. If you do not want your submissions to be considered for the poster session, please specify on the submission Web site.

Program and Registration Information

Complete program and registration information will be available in April 2016 on the conference Web site.



2016 USENIX Annual Technical Conference

June 22–24, 2016, Denver, CO

Sponsored by USENIX, the Advanced Computing Systems Association

Important Dates

- Talk submissions due: **Monday, February 1, 2016, 11:59 p.m. GMT**
- Notification to submitters: F**riday, April 15, 2016**

Conference Organizers

Program Co-Chairs

Ajay Gulati, *Zerostack, Inc.*
Hakim Weatherspoon, *Cornell University*

Program Committee

Mohit Aron, *Cohesity*
Mahesh Balakrishnan, *Yale University*
Haibo Chen, *Shanghai Jiao Tong University*
Byung-Gon Chun, *Seoul National University*
Paolo Costa, *Microsoft Research*
Dilma Da Silva, *Texas A&M University*
Angela Demke Brown, *University of Toronto*
Fred Douglis, *EMC*
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Andreas Haeberlen, *University of Pennsylvania*
Tim Harris, *Oracle*
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Jon Howell, *Google*
Hani Jamjoom, *IBM*
Anthony Joseph, *University of California, Berkeley*
Geoff Kuenning, *Harvey Mudd College*
Peter Pietzuch, *Imperial College London*
Sriram Rao, *Microsoft*
Benjamin Reed, *Facebook*
Scott Rixner, *Rice University*
Henry Robinson, *Cloudera*
Leonid Ryzhyk, *Samsung Research America*
Liuba Shrira, *Brandeis University*
Nisha Talagala, *Parallel Machines*
Theodore Ts'o, *Google*
Dan Tsafrir, *Israel Institute of Technology*
Andy Tucker, *Bracket*
Zhen Xiao, *Peking University*
Noa Zilberman, *University of Cambridge*

Overview

Industrial practitioners are invited to submit talk proposals to the Practitioner Talks Track of the 2016 USENIX Annual Technical Conference. The USENIX Annual Technical Conference is the senior USENIX forum covering the full range of technical research in systems software. This track seeks presentations about practical solutions and challenges to significant real-world issues facing industrial practitioners. It will provide a unique venue for industrial and academia participants to exchange ideas and experiences.

Examples of talk topics include, but are not limited to:

- Techniques that solve significant issues in practice
- Tool development and problem-solving experience report
- Forgotten research topics that are highly relevant to industry
- New challenges faced by industrial practitioners that need help from research
- Interesting data set or benchmark suite available for the community

Examples of technical areas include, but are not limited to:

- Architectural interaction
- Big data infrastructure
- Cloud computing
- Datacenter networking
- Deployment experience
- Distributed and parallel systems
- Embedded systems
- Energy/power management
- File and storage systems
- Mobile and wireless
- Networking and network services
- Operating systems
- Reliability, availability, and scalability
- Security, privacy, and trust
- System and network management and troubleshooting
- Usage studies and workload characterization
- Virtualization

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The content of the talk will not be included in the conference proceedings. If you are interested in the Refereed Papers Track, which accepts submissions of 11 pages, not including references, and 5 pages, not including references, please refer to the USENIX ATC '16 Call for Papers Web page at www.usenix.org/atc16/cfp.

What to Submit

Talk proposals must include the following and be submitted before the submission deadline to receive full consideration.

- **Title:** Should make it obvious what your talk is about
- **Description:** Include attendee takeaways and why people want to hear this talk; if applicable, please also provide white papers or Web pages or videos that support this talk
- **Should:** Please indicate the talk topic and area of interests
- **Speaker:** Include past public speaking experience, with a URL to past presentations if available
- **Duration:** Talk or tutorial length (either 20 or 40 minutes)

All submissions will be through the Web submission form on the Call for Talks Web site, www.usenix.org/atc16/cft.

Presenting a talk that you gave before in another venue is allowed. However, any talk proposal that derives from an earlier talk must explicitly mention where and when the earlier talk was given in the talk description. If you have questions, contact your program co-chairs, atc16chairs@usenix.org.

Submitters will be notified of talk acceptance or rejection by April 15, 2016.

Poster Session

The poster session is an excellent forum to discuss ideas and get useful feedback from the community. If you plan to prepare a poster for your talk, and want your poster to be considered for the poster session, please specify so in the submission form.

Program and Registration Information

Complete program and registration information will be available in April 2016 on the conference Web site.

Questions?

Contact atc16chairs@usenix.org.

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