11th Annual SSRC Retreat
1st Annual CRSS Retreat

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Welcome!

• SSRC is now 13 years old!
• Students
  • Graduating our 20th PhD student this year!
  • Dozens of MS degrees
  • Undergrad interns
• Research
  • Wide range of topics
  • Goal: cutting edge research in advance of dire need
• Industry
  • Provide ideas, technology and personnel for industry
  • Maintain ongoing relationships with industrial partners
  • Over 10 current sponsors
**Storage Systems Research Center**

**Overview**

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**Research Challenges**
- Finding and managing data
- New storage technologies
- Ultra-large-scale storage
- Reliability & self-healing
- Security
- Performance & efficiency

**Research Thrusts**
- Archival storage
- New metadata & indexing approaches
- Flash & storage-class memories
- Genomic data storage
- Reliable & secure storage

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**SSRC features**
- 2+4 core faculty
- ≈15 graduate students
- High degree of collaboration
- Close cooperation with sponsors
- High visibility

**SSRC sponsors**
- Department of Energy, NSF
- EMC, Hitachi, HP, Huawei, IBM, LSI, NetApp, Permabit, Samsung, Sandisk
- Over $1 million per year
2012–2013 accomplishments

• Graduating students (by end of Summer 2013)
  • 3 PhDs
  • 2 MS

• Papers in highly competitive venues
  • FAST (x2)
  • CIKM
  • Supercomputing
  • ICDE
  • MSST (x2)
  • MASCOTS (x2)
  • SYSTOR

• Conference organization: MSST, Dagstuhl workshop, and numerous program committees
Looking forward to 2013–2014

• Ongoing research in a wide range of areas
  • Next generation storage technologies
    • Shingled disk
    • Non-volatile memory (flash, byte-addressable)
  • Metadata and indexing
  • Archival storage
  • Security & reliability
  • Genomic data storage

• Continuing students (some graduating!)
• New students
• More collaborations
• CRSS...
Center for Research in Storage Systems (CRSS)

- As of July 1, 2013
  - UC Santa Cruz is no longer part of CRIS
  - UC Santa Cruz is the lead institution in the Center for Research in Storage Systems (CRSS)
- CRSS is an NSF-funded Industry/University Cooperative Research Center (I/UCRC)
  - Provides a venue for universities and industry to collaborate on research
  - Standardizes and formalizes intellectual property transfer
- CRSS is an “umbrella” over SSRC
  - CRSS members are SSRC members as well
- Companies can still join SSRC independently if they want
  - Get all SSRC member benefits
  - Don’t get IP rights—those are tied to CRSS membership
CRSS membership

- CRSS “industry” members are
  - Companies
  - National labs

- Membership fees set by membership agreement
  - $50K for “regular” members
  - $15K for small businesses

- Industry members gain benefits
  - Rights to all CRSS-funded research
  - Improved access to students (jobs, internships)
  - Added benefits (like this retreat!)
Industrial Advisory Board

- University proposes projects (perhaps with industry input)
  - Present at Spring or Fall meeting
  - Spring IAB meeting will be held tomorrow
- IAB advises CRSS researchers on which projects industry is most interested in
  - IAB members vote on interest level
  - Votes proportional to amount of funding via CRSS membership fees
- Universities undertake research projects with high levels of industry interest
- IAB also helps define bylaws...
CRSS: additional universities?

- Currently, CRSS is a single-university I/UCRC
  - Officially starts July 1, 2013
- We are actively seeking additional university members
  - Good research fit: collaboration is essential
  - Faculty we already know
- CRSS expansion would lead to
  - More research
  - More formal relationships between industry and universities
- Stay tuned...
Returning from 2012–13 leave

- I spent 2012–13 on 80% leave at Pure Storage
  - Returning to UCSC full time in the late summer

- Great experience!
  - Learned much more about industry (and startup) practices
  - Gained insights that will help us better educate and train our students

- Looking forward to continuing to working with our industrial partners in 2013–14 and beyond